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STUDY OF SELECTED MEDIUM AND SMALL MANUFACTURING
COMPANIES IN THE STATE OF MICHIGAN.

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**ACCEPTANCE OF CONTEMPORARY MANAGEMENT ACCOUNTING TECHNIQUES
IN SMALL MANUFACTURING FIRMS**

**A Study of Selected Medium and Small
Manufacturing Companies in the State of Michigan**

By

Saber Ali Mohamad Awad

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ABSTRACT

THE ACCEPTANCE OF CONTEMPORARY MANAGEMENT ACCOUNTING TECHNIQUES IN SMALL MANUFACTURING FIRMS

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In order for businesses to compete, grow, or even to survive, current and relevant information is needed for management decision making. In serving management's information requirements, the management accountant must apply the appropriate modern concepts and techniques in processing and communicating economic data.

The specific problem of this study is: to what extent are modern management accounting techniques really applied in current practice?; why are they applied?; and what are the reasons which prevent their application where they are not applied? Therefore, the first step in this study has been to find out the extent of application of management accounting techniques in practice. The second step is to investigate the process of diffusion of management accounting innovations, to identify the environmental conditions which influence this diffusion process.

The scope of this research study has been limited to eight selected management accounting techniques. They are: 1) Cost-Volume-Profit Analysis; 2) Contribution Reporting; 3) Standard Costing; 4) Operating Budget; 5) Responsibility Accounting; 6) Capital Budgeting; 7) Linear Programming; and 8) Network Techniques (PERT/CPM). Personal

interviews have been conducted with the chief management accountants of 35 small and medium manufacturing companies in the State of Michigan. A guiding questionnaire has been used to collect the required data through these interviews.

The analysis of the empirical data reveals the following findings: 1) Modern management accounting techniques are not widely practiced among small and medium companies. 2) The acceptance of the "non-traditional" quantitative techniques; i.e. linear programming and PERT/CPM, in current practice, is very low. 3) The average company in the sample is found to be applying only 3 of the eight techniques surveyed. 4) There is a relationship between the size of a company and the extent of application of these techniques, but this relationship is not statistically significant. 5) Top management and its attitude toward the value of management accounting information system have the primary impact on acceptance of management accounting innovations. 6) The management accountant's attitudes toward change and his professional competency to effect change, represents the second most important environmental condition that influences the diffusion process of management accounting innovations. 7) The nature of business operation, the availability of human and physical resources required, the relative value and cost of information, the type of ownership and the degree of competition are also important conditions in a company's environment that tend to influence accounting innovation; but their importance seem to come after top management's attitudes, the accountant's competency and attitude toward change, and the size of business. 8) Small and medium manufacturing

companies made very little use of outside consultants service in management accounting.

This study concludes that: 1) knowledge of modern accounting techniques, alone and by itself, does not necessarily guarantee the adoption and application of these techniques in practice. 2) Salesmanship, persuasiveness and communication accessibility seem to be essential characteristics that the management accountant should acquire beside mastering the technical and theoretical aspects of these techniques to become an effective agent of change in management accounting. 3) A need for continuing education, on the part of the management accountant is apparent especially in the new non-traditional quantitative techniques, to meet the challenge he faces in this era of information technology. Accounting professional associations should increase their active efforts in continuing education.

TO MY FATHER, MY MOTHER, AND MY WIFE.

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CHAPTER I

INTRODUCTION

This is an empirical study. Its main objective is to investigate the current practice of "modern management accounting concepts and techniques" to pinpoint the environmental conditions which affect the diffusion of such concepts and techniques in practice.

1.1 Background

There are an estimated 5,420,000 separate entities now engaged in conducting business on the American scene.¹ The small companies, as measured by the standards of the Small Business Administration comprise about 95 percent of the total business entities.² The economic welfare of the millions of owners and employees engaged in the small business sector will be determined, almost entirely, by the extent to which small business can survive and prosper in a continuously growing and changing economic system. It is estimated that in recent years between 350,000-400,000 business entities go out of business annually.³

¹Office of Planning, Research, and Analysis, Small Business Administration, Quarterly Economic Digest, Winter 1969, p. 18.

²Definition of small business will be somewhat modified for the purpose of this dissertation in Chapter II.

³Dun and Bradstreet Inc., The Failure Record Through 1967, New York, 1968, p. 2. (Combining four factors together: lack of experience in the line, lack of management experience, unbalanced experience and incompetence.)

An extremely high percentage of small business failures and discontinuances may be attributed to costs associated with inadequate management. Evidence of the important role which management plays in small business success or failure can be derived from enumerating the causes for business failures given by Dun and Bradstreet. It is estimated that over 90 percent of the business failure may be attributed to poor management.⁴

The University of Pittsburgh's Bureau of Business Research in a study to emphasize the importance of business management, with its two functions of planning and control, to the success or failure of small companies, has compared ten small manufacturing companies that had failed with ten other companies that were successful. Similarity of product lines, locations and time span of operation was a main characteristic of all companies studied. The study concluded that the reason for business failure was poor management, exemplified by poor financial planning, poor sales management and poor general administration which culminated in expenses exceeding income.⁵

The companies studied were scored on the basis of how well they measured up to ten basic principles of sound management. The scoring is reflected in Table I-1.⁶ Four of the ten issues (#1, 2, 3, and 5) directly involve accounting information. This study provides ample evidence that today's executive, if he is to be successful, must rely heavily upon a variety of management accounting information to formulate

⁴Ibid.

⁵Elizabeth Marting (ed), Management for the Smaller Company (New York: American Management Association, 1959), p. 5.

⁶Ibid.

plans, establish controls and guide the activities for which he is responsible.

TABLE 1-1
SOME CASES FOR SUCCESS OR FAILURE
IN SMALL BUSINESSES

Principles of Sound Management	Successful			Unsuccessful		
	Superior	Average	Poor	Superior	Average	Poor
1. Simple adequate records	81%	19%	0	0	27%	73%
2. Cost and performance standards	64	36	0	0	22	78
3. Informed management	81	19	0	0	26	74
4. Sound organization	70	28	2%	0	60	40
5. Balanced finances	81	14	5	2	53	45
6. Proper sales organization	78	22	0	0	34	66
7. Sound labor relations	58	31	11	0	81	19
8. Effective plant and equipment	74	26	0	8	60	32
9. Research and product development	72	23	5	0	28	72
10. Community and industry relations	73	27	0	0	35	65

In another study, the Stanford Research Institute has investigated the characteristics of 210 companies that have had exceptional growth performance and another 169 companies where growth histories have been below average. The conclusion of the study was that, in the typical fast growing companies, the entire organization is aware of the

significance of the planning and control functions.⁷

The spreading of competition, the increasing size of business enterprise, the growth of industry requiring heavy investment, the growing complexities of production operation, and the separation between ownership and management, are all factors which tend to force a transition from management based on an individual's memory of past historical experience and intuition to management heavily dependent on objective judgment based on relevant information. Management information requirements have risen sharply and will continue to rise as the pace of this dynamic change accelerates. In order for businesses to remain competitive and to progress, or even, in a relatively large number of cases, to survive, more information is needed for management decision making.

Processing of the economic part of the required information is the function of accounting. Accountants measure and communicate the economic data to the intended decision makers. In their measurement, accountants collect, classify and analyze economic data related to their business entities. Accountants through their processing of economic data serve basically two groups of users, internal management, and the business owners and other outside parties. Financial accounting has been mainly concerned with external reporting to owners, government and other interested parties; and has traditionally been oriented toward the historical stewardship aspects of accounting. Management accounting objective is to provide information to persons within an organization that enables them to make informed judgments and effective decisions

⁷See Robert B. Young, "Keys to Corporate Growth," Harvard Business Review (November-December, 1961).

which further the organization's goals. Management accounting is defined by an American Accounting Association Committee as:

The application of appropriate techniques and concepts in processing the historical and projected economic data of an entity to assist management in establishing plans for reasonable economic objectives and in the making of rational decisions with a view toward achieving these objectives.⁸

It is the responsibility of the management accountant to utilize the most appropriate technology available to produce the relevant information needed by management for its planning and control functions.⁹

In serving management's requirements for relevant information the management accountant should go beyond both the conventional models and historically valued transaction data. This changing emphasis of management accounting is quite noticeable in the literature on management accounting. Professors Crowingshield and Battista, in an article about four years ago indicated that a revolution in management accounting is taking place.¹⁰ They indicated that, until the early sixties, cost accounting textbooks and most cost accounting courses were primarily concerned with the mechanics of cost accumulation, while a large portion of today's cost accounting textbooks are devoted to an extensive treatment of cost behavior including statistical measures, cost-volume-profit analysis, profit planning, decision making cost and return on investment.¹¹

⁸American Accounting Association; Committee on Management Accounting 1958. The Accounting Review, April 1959, p. 210.

⁹_____; Committee to prepare, A Statement of Basic Accounting Theory (A.A.A. Evanston, Ill. 1966), p. 43.

¹⁰G. R. Crowingshield and G. L. Battista, "The Accounting Revolution," NAA Management Accounting (July 1966), p. 37.

¹¹Ibid.

Still in a related article another author says:

If you are reluctant to view (management) accounting as a changing art; you need only to reflect upon the terms used in many articles in recent issues of Management Accounting. The reader encounters such terms as regression analysis, learning curves, linear programming, sequential sampling, game theory, probability theory and PERT. These are additions to the language of the "new accountant", who has no intention of losing some of his most challenging functions to his colleagues in engineering, research and development, management sciences, etc.¹²

In fact, a reader of management accounting literature finds that many authors are strongly supporting and enthusiastically defending the usefulness of the newer techniques such as PERT or Critical Path Method, Linear Programming, statistical regression and other non-traditional mathematical techniques, along with some more established (traditional) techniques such as Responsibility Accounting, Contribution Margin Reporting, Flexible Budgeting, Capital Budgeting, and Cost-Volume-Profit analysis. However, the need exists for empirical evidence as to the actual extent of acceptance of these techniques in practice, and for an identification of the surrounding conditions governing the diffusion process of these techniques into practice.

1.2 The Objectives of the Study:

The objective of this study is to investigate empirically the extent of the current practice of "modern management techniques" and to identify the surrounding conditions which tend to influence the diffusion process of management accounting innovations. The specific objectives of the study can be enumerated as follows:

¹²Daniel Borth, Jr., "The Changing Role of the Accountant," Management Accounting (January 1967), p. 36-37.

1. To determine the extent to which the selected management accounting techniques are currently accepted and applied in a selected sample of small and medium manufacturing businesses in the State of Michigan. This will also point out any significant differences in the extent of application between traditional accounting techniques and non-traditional new quantitative techniques in the practice of these companies.
2. To examine the extent to which management accounting techniques which are applied in current practice differ from what are considered "modern management accounting techniques" as advocated by current literature on management accounting.
3. To study the process of diffusing management accounting innovations in small and medium manufacturing firms. The environmental conditions which influence such diffusion process will be examined. This would explore the surrounding conditions which prompted, as well as those which hindered, the acceptance and application of modern management accounting techniques in practice.
4. To find out the relationship between the size of a manufacturing firm and the extent of modern management accounting techniques accepted and applied in the firm's management accounting information system.
5. To find out the "agents of change" in diffusing management accounting innovation in the practice of small and medium manufacturing firms, and their respective role in the success of the diffusion process.

6. Deducing from 1, 2, 3, 4, and 5 some general observations about the diffusion of innovation processes as they are applied in management accounting.

1.3 Related Studies:

Among the main empirical studies which were written around the subject, I have selected the following because of their relevance to my topic.

Professors Sord and Welsh published their study on "Business Budgeting: A Survey of Management Planning and Control Practices," in 1958.¹³ The purpose of their study was to appraise the budgeting policies and practices employed by a select group of "Large and Leading" American and Canadian companies, as the means of implementing the planning and controlling functions of management. Their study is based on a selective sample of companies that they knew, in advance, were reputedly doing a "better-than average" job in budgeting. They disclosed in their study that 89% of these selected companies were using a formal budget program and that there was a substantial amount of agreement between the practices of these companies and the techniques as described in texts and periodicals.

Gary Luoma's doctoral dissertation on accounting information in managerial decision making for small and medium manufacturers¹⁴

¹³Barnard H. Sord and Glenn A. Welsh, Business Budgeting: A Survey of Management Planning and Control Practices. The Controllership Foundation (New York 1958).

¹⁴Gary A. Luoma, Accounting Information in Managerial Decision-Making for Small and Medium Manufacturers, A Doctoral Dissertation, the substance of which was published in NAA Research Monograph No. 2, National Association of Accountants. N. Y. 1967.

gave particular attention to the utilization of accounting in the decision areas of; (1) capital equipment analysis; (2) cost-volume-profit analysis; (3) financial budgeting; (4) inventory control; (5) make-or-buy decisions and (6) product pricing. He conducted his research with six in-depth case studies, plus a mail questionnaire. This study disclosed that accounting data are generally not being used in a sophisticated, informative manner by decision makers, and in certain instances accounting information might not be currently beneficial or necessary to management.

Dr. Ronald Wright's doctoral dissertation titled, "An Inquiry into Budgetary Planning and Control Techniques" in small business environment with emphasis on small manufacturing companies is another related and relevant empirical study.¹⁵ One of Dr. Wright's conclusions is that the use and non-use of a budget and the method of constructing and using a budget can be related to the characteristics of small business.

The American Institute of Certified Public Accountants' Committee on Management Services in its Bulletin No. 2, disclosed that Planning and Control is the slogan of progressive modern management in the largest and most successful companies.¹⁶ This slogan works for small as well as large companies; however, "...the smaller and simpler a

¹⁵Ronald M. Wright, An Inquiry into Budgetary Planning and Control. Techniques in the Small Business Environment with Emphasis on Small Manufacturing Companies. Unpublished Doctoral Dissertation, University Microfilms Inc. (Ann Arbor, 1963).

¹⁶Committee on Management Services, Budgeting for Profit in Small Business, Bulletin No. 2 (The AICPA, New York 1959), p. 5.

business, the simpler its budget. The larger and more complex a business, the more elaborate its budgets."¹⁷

A major source of related studies is found in the National Association of Accountants' report series which contributes significantly to the understanding of management accounting theory and practice. However, some special characteristics of the NAA studies should be mentioned here. First, the NAA's reports describe the theory behind the concepts or techniques under study, and tell how they are being applied in those businesses where it is known in advance that they are in use. The objective of these studies is to give "good examples" of how others could apply them, rather than what conditions should exist before they could be applied. Second, most of the participating companies in the NAA's samples represent the large and leading companies. Third, most of these studies were done a long time ago and a more current assessment of today's management accounting practices should be desirable.

An important source of studies concerned with the diffusion of innovations is available in areas other than management accounting. The diffusion of innovations studied range from new drugs among physicians to hand tools among primitive tribes, and from driver training among primary schools to hybrid corn among farmers. However, I could not find any such studies explicitly made on the diffusion of management accounting innovations. Professor Rogers has done many studies on the diffusion of innovations in the agricultural area. His process of diffusion will constitute a framework for this study.¹⁸

¹⁷Ibid.

¹⁸Dr. Everett M. Rogers, Michigan State University; especially his textbook, Diffusion of Innovations, The Free Press, New York (1962).

1.4 Statement of the Problem and Significance of the Study:

The preceding brief review of the relevant literature indicates that the rapidly growing companies are characterized as being forward looking, with management devoting time and effort to planning and controlling the business. The studies further emphasize the relationships between the size and complexities of business enterprises and the extent of application of budgeting. However, none of these studies has tried to explore the extent of acceptance of a wider scope of modern management accounting techniques in the current practice of small and medium manufacturing concerns. Therefore, a study to acquire more understanding of what today's practicing management accountant is doing, to face the challenge raised against him to justify his role as a member in the management team, is in order and is needed, and this study intends to fill this gap. In addition, most of the related studies reviewed are concerned either with stating the extent to which the particular technique is applied or with the description of how these specific techniques are generally applied. Very few attempts have been made to explore the why's of the question from its two sides, which this study is intending to fulfill as its major objective. The surrounding conditions which tend to prompt or inhibit acceptance and adoption of management accounting techniques will be a major emphasis of this study. This study further will attempt to determine the "change agents" in these companies and their role of diffusing management accounting innovations.

As to the significance of this study, the evidence obtained by this empirical research should be useful to accounting educators and to the National Association of Accountants, as a measure of the success of their extensive continuing educational efforts in the area of management

accounting. Exploring the diffusion process of management accounting innovations should prove very useful for increasing the efficiency of their educational efforts. This study is also very significant to me personally, since I am expected to be assigned the responsibility of teaching management accounting upon the completion of this doctoral dissertation. An insight into the theoretical foundations as well as the practical application of management accounting will give me a more comprehensive understanding of the prospective usefulness as well as a logical appreciation of the limitations of applying modern management accounting techniques in the real world of business.

1.5 Scope of this Study:

To set boundaries on such wide scope, eight techniques were chosen on the premise of their usefulness and applicability as tools of managerial planning and control. These selected techniques are not completely exclusive in the sense of the ability to apply each one separate from the other; instead they are interrelated as will be shown in Chapter III of this dissertation. The term "modern management accounting techniques" in this study is set to mean "contemporary" and includes some well known techniques as well as some more recent and less known.¹⁹

The selected management accounting techniques are:

1. Cost-Volume-Profit Analysis
2. Contribution Margin Reporting

¹⁹Walter B. McFarland in his Concepts for Management Accounting, National Association of Accountants, New York, 1966, has defined "accounting concept" as "a mental expression" consisting of the characteristics associated with terms such as entity, period, cost, revenue and profit." He has defined "accounting techniques" as ways to implement concepts. I am adopting the same definition in this thesis.

3. Standard Costing
4. Operating Budget
5. Responsibility Accounting
6. Capital Budgeting
7. Linear Programming
8. Network Analysis - Program Evaluation and Review Technique (PERT/Cost) or the Critical Path Method (CPM/Cost)

1.6 Plan of the Study:

The second chapter of this study is devoted to the research methodology and description of the characteristics of the companies and of the management accountants in the research sample.

The third chapter will include the theoretical foundation of management accounting. The logical foundations of modern management accounting will be the subject of this chapter. The extent of acceptance of management accounting techniques in current practice will be the subject of the fourth chapter. The surrounding conditions necessary for diffusing new ideas in management accounting practice will be discussed in the fifth chapter.

The sixth chapter of this study will be devoted to the remaining part of the diffusion process of management accounting innovations; who are the agents of change and when, why and for what purpose did the change take place? Chapter VII will include the study's summary, conclusions and recommendations.

CHAPTER II

METHODOLOGY OF THE RESEARCH STUDY

2.1 A Matter of Definition:

A definition of what constitutes a small, a medium, or a large company is a due matter at this point of the dissertation. Many researchers would agree that one of the difficulties in gaining significant information about small business practices is the lack of agreement on any definition of small business.¹ One study will base its definition on total sales, another on total employment, still another on total assets, but seldom will studies agree with one another.

According to the Department of Commerce Standards of 1941, firms were considered small businesses in manufacturing if they had 100 or fewer wage earners. In 1951, this ruling was amended to recognize that size standards would vary from one type of manufacturing to another and a range of 100 employees to 2500 employees was set as small business in their specific manufacturing classifications.

The Small Business Act of 1953 provided that a Small business concern is "one which is independently owned and operated and not dominant in its field of operation." The Act also authorized the Small Business Administration, in making a more detailed definition, to use

¹Albert K. Wickesperg, Organizational Relationships in the Growing Small Manufacturing Firms. Small Business Management Research Report -- The University of Minnesota, Minneapolis, Minn., April 1961, p. 2-3.

such criteria as number of employees and sales volume. The SBA detailed definitions would differ from one purpose to another. However, a range up to 1500 employees would be considered small business according to the employment size standards set forth in the legislation.²

Two general characteristics of the size standards adopted by the SBA or any other organization can be observed by reviewing literature on management of small business. First, the size standard is classified into two categories, either small or large, nothing in between. Second, in most cases, size is classified according to only one criterion, either sales volume, employment or assets. No study was found which defines a size class by multi-criteria. These definitions might be appropriate for the objectives they were set for; no attempt will be made here to argue against this. However, neither of these definitions alone would best serve the objectives of this dissertation; one of which is to find out whether or not there is any relationship between size of an enterprise and the degree of elaboration of its management accounting system. Size, as seen in this dissertation, is regarded as a measure of relative complexity of operation, in addition to its usual meaning of relative bigness of the firm itself.

The basic general premise concerning the need for and the possibility of applying management accounting concepts and techniques is the growth in the degree of complexity of a company's operations. In the very small company, where the organic functions of organization are

²Code of Federal Regulations, Title 13, Business Credit and Assistance, Revised as of January 1970, Part 121 - Small Business Size Standards.

performed by a single individual or a few partners, the owner-operators' accounting information needs are minimal. This owner-operator can be well-enough informed through first hand information acquired from direct contact with operations. Increasing business volume as measured in terms of sales brings a need for separating the organic functions one from the other, and the managerial tasks of planning and controlling are separated from the purely operative tasks. The owner-operator, in this case, might have to sacrifice his role as operator to become more involved as a manager, thereby losing some of the first hand information he used to acquire directly. Thus the need to substitute more formal means of information begins. Further, as the managerial duties increase in volume and become more complex, the accounting function typically achieves a separate organizational status to help management manage the business. Similarly, the other functions, like production, marketing, personnel, research and development and others, are given separate organizational status. Information generated at the operating levels becomes beyond the reach of heads of these organizational segments, increasing the need for more accounting information. Thus, the general premise would be that the more complex a business becomes, the more sophisticated the management accounting system should be, to live up to the increasing demands for more relevant information to plan and control.

A size standard based on sales volume alone might be an illusory measure of business complexity. The same observation could be made regarding a size standard based on average employment or total assets alone. A more representative measure of complexity of an operation could be a standard based on several rather than a single variable. Such an approach will be taken in this dissertation because of its

relevance to the study objectives. However, a word of caution should be mentioned here. Any definition of size will be arbitrary at most, and its appropriateness should be viewed in terms of its usefulness in achieving the objectives it is set for. The size standard set here is an attempt to classify companies into very small, small, medium, large and the largest.³ Total average employment, total sales volume, total assets invested, number of major product or product lines and number of producing departments, are the criteria used for this classification. The following table shows the boundaries of each size class in the manufacturing industry.

TABLE II-1
SIZE STANDARD CLASSIFICATION

Size Class	Employment	Sales (in \$ million)	Assets (in \$ million)	Major Product Lines	Producing Depart- ments
Very Small	Less than 100	Less than \$2	Less than \$1	1	1 - 2
Small	100 - 500	2 - 10	1 - 5	2 - 5	3 - 5
Medium	500 - 1000	10 - 50	5 - 25	6 - 10	6 - 10
Large	1000 - 2500	50 - 100	25 - 50	11 - 15	11 - 15
The Largest ⁴	More than 2500	More than 100	More than 50	More than 15	More than 15

³The 500 largest industrials as reported by Fortune, May 1970, p. 194-200.

⁴Consistency with the boundaries set forth by the 500 largest industrials is observed to the greatest extent possible.

2.2 The Research Methodology

In order to achieve the objectives specifically stated in Chapter I, the methodology of this research study has been designed to investigate the practical dimensions of the problem against established conceptual foundations as they exist in current management accounting literature. Two stages of research were set forth to accomplish this end, library and empirical.

2.2.A The Library Research:

The first stage includes an intensive library study, the objectives of which are as follows:

1. To provide an understanding of what "modern management accounting" concepts and techniques are as they exist in current literature.
2. To create an appreciation of the prospective role of management accounting as the core of an information processing system for management decision-making.
3. To get a total view of the applicability of quantitative techniques in management accounting as advocated in contemporary writings in the field.
4. To provide a review of prior empirical studies on management accounting related to the subject under consideration.

Chapter III of this thesis is a major product of the efforts given to library research. The theoretical foundations of management accounting are the center of discussion in that chapter.

2.2.B The Empirical Research:

Personal interviews were chosen instead of mail questionnaires as the method of collecting empirical data for this study, primarily in

an effort to overcome some of the communication problems involved in the mail questionnaire. A "guiding questions" list was first constructed. Testing of this primary guide was done by interviewing two different company's controllers. Changes and reorganization of the questions were made accordingly. The intermediate questionnaire guide was further tested in interviews with two more controllers and a few final modifications were made.

The final guiding questionnaire is included in Appendix A of this study. It consists of a four question series. The first series, group A, covers general data about the company and the management accountant interviewed, as well as the objective of management accounting from the standpoint of the company policy. Group B of the questionnaire consists of a major question on each of the eight techniques chosen as the scope of this study to get data on how each technique is applied. The third series, group C, consists of ten questions repeated for each of the eight techniques to get data on the diffusion process of the technique in each company. The last series of this guiding questionnaire, group D, deals with the role of outside management consulting services in the diffusion process of modern management accounting.

The population of this empirical research was chosen to be the manufacturing industry. Availability of much theoretical writings on manufacturing accounting, larger range of operational complexity and large share of the industry in GNP are among the factors for this choice. The state of Michigan provides the geographical boundaries of this research; time and financial resources available were behind this geographical decision. We can find no plausible reason to believe that the environment for management accounting is any different in Michigan

than elsewhere.

A sample of 30-40 companies was considered to be sufficient for studies based on personal interviews. A sample of 40 small and medium manufacturing companies was the original size target of this study.

The sample subjects are companies' management accounting systems as described by the management accountant in each company. Management accountant is defined here as the officer in charge of the internal accounting function in a company. There is no uniformity in the organizational titles of this man. In one company, he may be named the secretary and treasurer, in another, he may be the controller, still in a third company he may have another title. However, "management accountant" is used in this study as the more general title.

Selection of management accountants for possible participation was made from the rosters of Certified Public Accountants and of chapters of the National Association of Accountants in Michigan.⁵ The accounting systems of companies selected were completely unknown to the researcher at the time of sample selection. Randomness of these accounting systems in this sense of selection without prior knowledge of the accounting systems is one major characteristic which clearly differentiates this study from others which were undertaken with some advance knowledge of the accounting practices of the subject companies.

The companies whose management accountants were selected for interviews were checked for appropriate size and industry classification in both "The Directory of Michigan's Manufacturers" and the "Dun and

⁵A word of deep acknowledgement to Professor Gardner M. Jones, the chairman of the dissertation committee, is due here, for initiating contacts with interviewees.

Bradstreet \$1 Million Business." Sixty-five management accountants were selected. Twelve of them were contacted directly by telephone calls, and 53 by covering letters and then telephone calls for appointments. The covering letter is included in Appendix B. Forty-one accountants agreed to participate in this study and later were interviewed. Each interview lasted between one and three hours, with two hours as an average duration. Six companies of those interviewed were later disqualified because they were found not to fall within either the desired population characteristics or did not fit the size standards as defined in this study. Two companies were found to be mostly involved in non-manufacturing operations. One company was found to be very small on every measure. Two companies were found to be subsidiaries of two of the largest industrials and their accounting practices were dictated by the central accounting offices. One firm was known to be a subsidiary of another company included in the study and its management accounting system is similar to that of its parent. This left 35 companies out of the 41 interviewed to be a usable sample for this study. Out of the 65 accountants originally selected, 24 could not participate for various reasons. Seven accountants had changed jobs, and no attempt was made to contact the new accountants in charge because of the possibility of getting incomplete information about management accounting development in the particular company. Twelve accountants declined to participate indicating that management policy does not allow giving the required data. Still three other companies were outside the size limits of this study and were not interviewed. I could not contact another three accountants within the time of the survey. Considering the participants plus only those declined to participate to measure the participation

ratio, this would make 41 against 12 or about 77 percent. The usable sample is about 84 percent of the participants.

2.3 Description of the Research Sample

2.3.A Some Characteristics of the Companies Included:

1. Geographical distribution:

Collecting the empirical data took about four months. Within this period an effort was made to cover most of the industrial concentration centers in the State of Michigan. Table II-2 shows a distribution of these industrial areas grouped according to their geographical locations from west to east.

TABLE II-2
GEOGRAPHICAL DISTRIBUTION OF THE COMPANIES
INCLUDED IN THE SAMPLE

No.	Geographical Location	No. of Firms	% of Sample
1	Muskegon, Coopersville and Grand Haven	3	8.50
2	Grand Rapids and vicinity	3	8.50
3	Battle Creek and Kalamazoo	4	11.00
4	Hastings, Odessa and Bellding	3	8.50
5	Lansing and Mason	2	6.00
6	Alma	1	3.00
7	Jackson and Addison	7	20.00
8	Owosso, Corunna and Durand	4	11.00
9	Howell, Ann Arbor, and Manchester	3	8.50
10	Detroit (and greater vicinity)	<u>5</u>	<u>14.00</u>
	Total	35	100%

2. Industrial Classification:

Table II-3 shows the classification of the firms included in the sample, according to the U. S. Census classification of manufacturing industry.

TABLE II-3
INDUSTRIAL CLASSIFICATION OF THE SAMPLE⁶

Major Code Number	Manufacturing Industry - Major Groups	No. of Firms	% of Sample
	<u>Durable Goods Manufacturers</u>		
19	Ordinance and Accessories	1	3.00
25	Furniture and Fixture	1	3.00
32	Stone, Clay and Glass Products	1	3.00
33	Primary Metal Products	2	6.00
34	Fabricated Metal Products	7	20.00
35	Machinery Except Electrical	9	25.00
36	Electrical Machinery, Equipment & Supplies	4	11.00
37	Transportation Equipment	2	6.00
	<u>Non-Durable Goods Manufacturers</u>		
20	Food and Kindred Products	2	6.00
27	Printing and Publishing	1	3.00
28	Chemical and Allied Products	2	6.00
30	Rubbers and Miscellaneous Plastic Products	1	3.00
39	Miscellaneous Manufacturing Industries	<u>2</u>	<u>6.00</u>
	Total	35	100%*

⁶Classification is made according to the principal product line of the firm.

*May not add up for rounding effect.

The sample is covering both durable and non-durable manufacturing firms, with about 77 percent devoted to durable goods manufacturers and 23 percent for non-durable goods.

3. Size Standards Classification of the Sample:

Size standards, as it was argued earlier in this chapter, are viewed as measure of complexity of operations and an indicator of the degree of need for detailed management accounting information. In the following tables the 35 sample firms are classified in terms of:

(a) average annual employment; (b) average annual sales; (c) total assets employed in the business; (d) number of major products or product lines; and (e) number of producing segments in the firm's organization. Sizes are classified in this section according to the boundaries outlined in Table II-1.

a. Average Annual Employment:

TABLE II-4
AVERAGE EMPLOYMENT DISTRIBUTION
OF THE SAMPLE

Average Annual Employment	No. of Firms	% of Sample
Less than 100 employees (v.s)*	1	3.00
100 and less than 250 (S)	14	40.00
250 and less than 500 (S)	13	37.00
500 and less than 1000 (M)	4	11.00
1000 and above (L)	<u>3</u>	<u>9.00</u>
Total	35	100%

*(Very Small = V.S; Small = S; Medium = M; Large = L; Largest = Lat.

Table II-4 above, shows that only one firm was "very small", when measured in terms of average total employment. About three fourths are classified as small, about 11 percent as medium and less than 9 percent as large companies.

b. Average Annual Sales:

TABLE II-5
AVERAGE ANNUAL SALES DISTRIBUTION
OF THE SAMPLE

Average Annual Sales (in \$ million)	No. of Firms	% of Sample
Less than 2 (V.S.)	0	0
2 but less than 3 (S)	3	8.00
3 but less than 5 (S)	10	29.00
5 but less than 10 (S)	10	29.00
10 but less than 20 (M)	5	14.00
20 but less than 50 (M)	6	17.00
More than 50 (L)	<u>1</u>	<u>3.00</u>
Total	35	100%

As shown in Table II-5 above, no company with average annual sales less than \$2 million is included in the sample. About two-thirds are small companies, as measured by sales of \$2 to \$10 million. About 31 percent can be considered medium companies. Only one company is classed as "large".

c. Total Assets Employed:

Total assets employed is defined for the purpose of this study as the total asset side of the financial position statement less any investment in other companies.

TABLE II-6
TOTAL ASSETS EMPLOYED DISTRIBUTION
OF THE SAMPLE

Total Assets Employed (in \$ million)	No. of Firms	% of Sample
Less than 1 (V.S.)	1	3.00
1 and less than 2 (S)	6	17.00
2 and less than 5 (S)	14	40.00
5 and less than 10 (M)	6	17.00
10 and less than 25 (M)	7	20.00
25 and less than 50 (L)	1	3.00
50 and above (Lst)	<u>0</u>	<u>0</u>
Total	35	100%

According to the table above, only one company is considered very small in terms of this measure. Small companies (\$1 to \$5 million) represent about 57 percent. Medium companies constitute about 37 percent; leaving only one company classified as large in the sample according to this classification.

d. Number of Major Products or Product Lines:

The number of major products or product lines was given by the management accountants interviewed. There is a possibility of different perceptions to this question by different persons. However, the point was made to get an answer according to the company's internal reporting system when its reports are broken down by product lines. In the same time, mutual discussions between this researcher and his interviewees were made to assure that product lines constitute major classifications of what the subject company is manufacturing. This question was made with an eye for the potential need for more complex product profitability reporting.

TABLE II-7

NUMBER OF PRODUCT LINES DISTRIBUTION

Number of Product Lines		No. of Firms	% of Sample
1	(V.S.)	3	8.50
2-5	(S)	18	51.00
6-10	(M)	7	20.00
11-15	(L)	2	6.00
More than 15	(Lat)	2	6.00
Job Orders	(M)	<u>3</u>	<u>8.50</u>
Total		35	100%

According to the table above, less than 9 percent of the sample are considered very small when measured by the break down of major products. About 51 percent are considered small companies from this

respect. Medium sized companies represent 20 percent; and about 6 percent are considered large companies. In this classification standard, about 9 percent are producing according to special job orders and the number of major products can not be obtained because of continuous changes from one order to another; they are classified here as medium.

e. Number of Producing Departments:

Again here, as in the previous classification, perception of what is a producing department and differing organizational structure may affect the comparability of the data obtained for this matter. However, due care has been taken to relate answers of this question to internal accounting reporting system in each company, especially the potential need for responsibility accounting.

TABLE II-8

NUMBER OF PRODUCING DEPARTMENT DISTRIBUTION

Number of Producing Depts.		No. of Firms	% of Sample
1 or 2	(V.S.)	3	9.00
3-5	(S)	12	34.00
6-10	(M)	13	37.00
11-25	(L)	7	20.00
More than 25	(Lst)	<u>0</u>	<u>0</u>
Total		35	100%

Very small companies constitute less than 9 percent of the sample, when measured by this measure of complexity. Small companies represent about 34 percent. Medium companies are about 37 percent. Twenty percent

of the sample are classified as large companies.

Taking the five size criteria into consideration, an attempt to get an average size measure for each company is done by giving equal weight to each of these criteria and computing the average size for each company. This computation resulted in 25 companies classified as small and 10 companies classified as medium, on the average. Details of this classification are included in Appendix C.

2.3.B Some Characteristics of Management Accountants:

In this section, a description of the management accountants interviewed and included in the sample is presented. Data about their formal organizational title, education, service period in the present companies, professional membership and their approximate age, has been gathered through the personal interviews.

1. Formal Organizational Titles:

Most of the management accountants interviewed, and included in the sample, are the heads of the accounting function in their firms. However, as it is known from other studies, there is no uniformity of the formal titles or their assigned duties.⁷

Assertion of such lack of uniformity is apparent in this sample. However, two titles are predominant; the treasurer and the controller. In most of the sample firms the treasurer supervises the controller. In many cases, however, the chief financial officer in a company was the controller. Table II-9 shows that about 29 percent of the individuals in the sample carry the treasurer title, while about 46 percent hold the

⁷"Development in Financial Organization 1915-1965" - A Supplement to Financial Executives, September 1965.

TABLE II-9

**FORMAL ORGANIZATIONAL TITLES
OF MANAGEMENT ACCOUNTANTS**

Title or Position	No. of Accountants	No. of Sample
V. P. of Finance	2	6.00
Treasurer	6	17.00
Treasurer and Controller	2	6.00
Secretary and Treasurer	4	11.00
Secretary	1	3.00
Controller (or Assistant to)	16	46.00
Chief Accountant	<u>4</u>	<u>11.00</u>
Total	35	100%

controller title. In eleven percent of the sample, "the chief accountant" or "the accountant" were the title of the financial officer in the company.

2. Accountants' Formal Education:

Accountants interviewed and included in the sample differ greatly in their formal education as shown in Table II-10 below.

The most significant characteristic of this sample, is that 75 percent of the accountants included have formal education of bachelor's degree or more in business. Only 20 percent have less than a bachelors degree. Most of that 20% have junior business school diplomas. Only 2 persons in this sample had no formal education in accounting.

TABLE II-10

**FORMAL EDUCATION OF ACCOUNTANTS
INCLUDED IN THE SAMPLE**

Formal Educational Status	No. of Accountants	% of Sample
Less than high school diploma	1	3.00
High School to Junior College degree	6	17.00
B.A. or B.S. in Business	17	48.00
B.A. or B.S. and M.B.A.*	10	29.00
Others**	<u>1</u>	<u>3.00</u>
Total	35	100%

*One accountant included in this category has his B.S. in Chemistry.

**This accountant has his formal education in Physics.

3. Service Period in the Present Company:

Accountants interviewed also differed in the period of service they spent in their present firms. As it is shown in Table II-11 below, 60 percent of them have spent less than 5 years in their present firms. About 26 percent have service period between 5 and 10 years. Only 14 percent of the sample have spent more than 10 years in their companies.

4. Accountants' Professional Memberships:

The management accountants included in the sample are either Certified Public Accountants, members of the National Association of Accountants or both. As shown in Table II-12 below, 71 percent hold membership in the American Institute of Certified Public Accountants alone or along with Michigan Association of CPAs membership. About

TABLE II-11

ACCOUNTANTS' SERVICE PERIOD IN THE PRESENT FIRMS

Service Period (in years)	No. of Accountants	% of Sample
Less than 2	6	17.00
2 but less than 5	15	43.00
5 but less than 10	9	26.00
10 and above	<u>5</u>	<u>14.00</u>
Total	35	100%

TABLE II-12

ACCOUNTANTS' MEMBERSHIP IN
PROFESSIONAL ASSOCIATIONS

Professional Associations	No. of Accountants	% of Sample
American Institute of Certified Public Accountants (with or without Michigan Association of CPA's) alone	14	40
National Association of Accountants alone	9	26
Both AICPA and NAA	11	31
None	<u>1</u>	<u>3</u>
Total	35	100%

57 percent of the sample are members of the National Association of Accountants, and more than half of them hold CPA certificate(s) at the same time. Only one accountant included in the sample is not a member of either organization. He is a member of the National Management Association. Six accountants have, in addition, memberships in Financial Executives Institute, Planning Executives Institute, Tax Executives Institute or American Accounting Association.

5. Approximate Age of Accountants

Accountants interviewed also differed widely in their ages. About 23 percent of them are younger than 35 years old. About 37 percent are between 35 and 45 years of age. Forty percent of the sample are older than 45 years. The youngest accountant interviewed was 29 years of age, and the oldest one was 62 years old.

TABLE II-13

ACCOUNTANTS' APPROXIMATE AGE DISTRIBUTION

Age (in years)	No. of Accountants	% of Sample
Younger than 35	8	23.00
35 and younger than 40	6	17.00
40 and younger than 45	7	20.00
45 and younger than 50	7	20.00
50 and older	<u>7</u>	<u>20.00</u>
Total	35	100%

2.4 Limitations of the Study:

1. The fundamental and inescapable limitation of interview-based research is that its conclusions depend on the degree of perception and interpretations of both the interviewer and the interviewees. However, a basic introduction to each series of questions was made by this researcher to every accountant interviewed, to try to assure mutual understanding of the techniques and terminology, to reduce the probability of this limitation. However, it must be acknowledged that there is no way to eliminate the possibility of different conceptions.
2. The second limitation of this study is also attributed to its type of research. Conclusions and findings of this study will not be susceptible to generalization about management accounting in all the U.S.A. Rather, they will only represent the practice of management accounting in those companies participating in the study and included in the sample, though one might expect the findings in non-represented companies to be similar. We have seen no evidence that would suggest the environment of management accounting in Michigan small manufacturing enterprises to be different from that of management accounting in such enterprises elsewhere. One observation could be made, however: inasmuch as the companies and accountants selected are those where the accountant-in-charge is sufficiently advanced in outlook to be active in professional organizations, one might expect them to be more progressive in the adoption of "new" techniques than those

companies and accountants who are not professionally active.

Sample populations in social science research must be chosen in part by the criterion of availability, so some unintended and unmeasurable bias may be introduced in the process of selection. There appears to be no genuinely workable solution for this dilemma; we recognize it and live with it.

2.5 Summary:

The main objective of this chapter is to describe the research methodology of the study. In the first part of the chapter, a definition of company size was selected to suit the purpose of this dissertation. This definition is based on several rather than a single variable as a measure of operational complexity. In section II, the research methodology is discussed in detail. A description of the companies included in the empirical research is made according to the size definition adopted in this study. In addition, the characteristics of the accountants interviewed and included in the sample are also shown in the third part of this chapter.

CHAPTER III

MANAGEMENT ACCOUNTING AND THE FUNCTIONS OF MANAGEMENT

3.1 Introduction:

With the exception of mass production methods and other technological advances, the evolution of management science is perhaps the most significant factor in the economic development of the United States. Management Science is based on the idea that a scientific approach-- investigation, analysis and decision making -- should be used to resolve managerial problems. Probably the most significant characteristic of management science is its increasing reliance on information instead of relying on intuition and imagination in making decisions.

From a potentially unlimited variety of economic data, the management accountant selects data that are particularly relevant to problems facing the managers in his company. By applying concepts and techniques of measurement, classification and communication, the management accountant converts raw data into relevant information. By helping to interpret this information, he participates in decision-making processes.

3.2 The Functions of Management:

The meaning of management has been expressed in a number of different ways. Management has been defined by Terry as "the accomplishing of a predetermined objective through the efforts of other people."¹

¹George R. Terry, Principles of Management, Revised Ed., Richard D. Irwin, Inc., Homewood, Ill., 1956, pp. 18-19.

Professor McFarland expressed the same meaning in different words:

"management is the process by which the executives of an organization combine scarce resources in achieving given ends."² Still management was defined in another way: "managing is a social process which comprises of a series of actions that lead to the accomplishment of

TABLE III-1
FUNDAMENTAL MANAGEMENT FUNCTIONS

Henry Fayol	W.H. Newman	G.R. Terry	Koontz & O'Donnell	D. McFarland
Forecast & Plan	Planning	Planning	Planning	Planning
Organize	Organizing	Organizing	Organizing	Organizing
Control	Assembling	Actuating	Directing	Assembling Resources
Coordinate	Directing	Control	Control	Controlling
Command	Control		Coordination (as the essence of manager-ship).	Representing Coordinating Deciding Delegating Evaluating Creating Leading, etc.

(Source: Previously cited textbooks)

²Dalton E. McFarland, Management: Principles and Practices, 2nd Ed., The Macmillan Co., New York 1964, p. 57.

objectives."³ Koontz and O'Donnell considered management to be the process of creating the internal environment for organized effort to accomplish group goals.⁴

It is clear, from the definitions cited above plus many more similar in substance though differing in wording, that they all agree that management is a social process. The definitions also show two more common elements: an objective or purpose to be accomplished and working with resources, especially human. However, agreement is lacking when we try to find what are the elements of this process or what are the functions the managers perform. Table III-1 shows the fundamental functions of management, as advocated by a respected group of management scholars, as an illustration of the lack of such agreement.

Although the words differ, the same basic thread of planning, organizing and control runs through all of these definitions. Regardless of the different functional aggregations, management is seen without exception as performing three basic functions of planning, organizing and control.⁵

However, the management accountant can make his greatest contribution in the planning and controlling functions. His contribution is less apparent in the organizing function. Accordingly, in this study we will

³William H. Newman, Charles E. Summer and E. Kirby Warren, The Process of Management - Concepts, Behavior and Practice, 2nd Ed., Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1967, pp. 9-12.

⁴Harold Koontz and Cyril O'Donnell, Principles of Management: An Analysis of Management Functions, 3rd Ed., (McGraw-Hill, 1964), p. 26.

⁵American Accounting Association - Committee to Prepare A Statement of Basic Accounting Theory, A.A.A. (Evanston, Ill, 1966), p. 43.

concentrate on the management accountant's contribution in only management planning and controlling. We will not deal with the organizing function in this study.

Professor Anthony, however, recognizing the interrelationship between planning and control, classified the functions of management as "strategic planning", "management control", and operational control.⁶ He defined strategic planning as "the process of deciding on objectives, and on the policies that are to govern the acquisition, use and disposition of these resources." Management control is defined as "the process by which resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives." Operational control is defined as "the process of assuring that specific tasks are carried out effectively and efficiently."⁷ A look into Dr. Anthony's framework would lead the reader to believe that planning and control exist in his three classifications with planning dominant in strategic planning; in management control, the emphasis is on both planning and control, while in operational control, the control function is dominant with little planning.

The planning and control functions of management can be depicted as a circle as shown in Figure III-1.

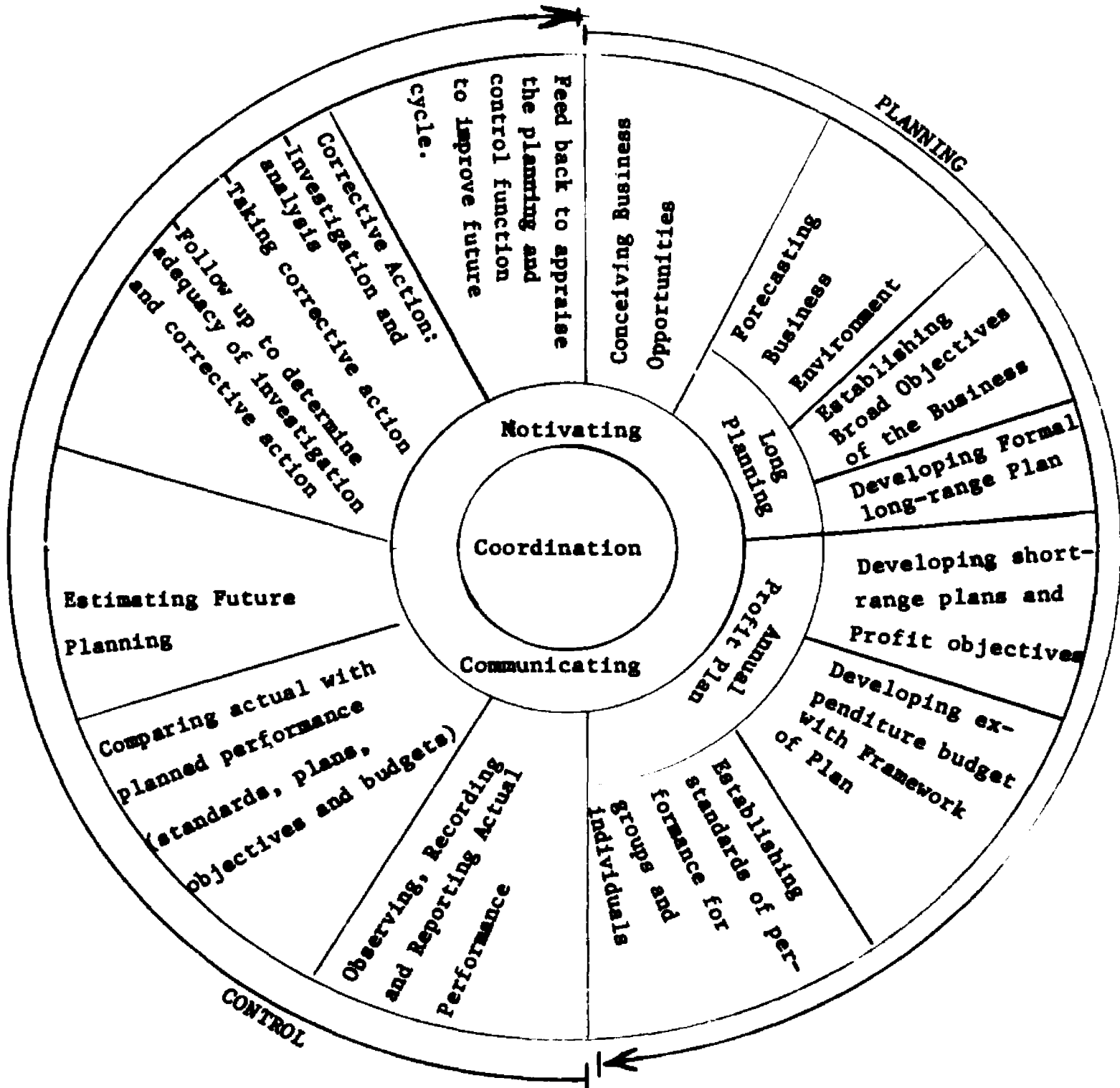
In actual practice, these functions of management are inextricably interwoven and interrelated. The performance of one functions does not cease entirely before the next function starts. One can say, however,

⁶Robert N. Anthony, Planning and Control Systems; A Framework for Analysis, Division of Research, Graduate School of Business Administration, Harvard University (Boston 1965), p.

⁷Ibid., p.

FIGURE III-1

MANAGEMENT'S PLANNING AND CONTROL FUNCTIONS



(Source: Glenn A. Welsch, Budgeting: Profit Planning and Control, 2nd Ed. Prentice-Hall, Inc., Englewood Cliffs, N.J. 1964, p. 8 with some modification).

that unless the planning functions is performed, the control function would not be able to operate. Beyond that they are normally carried on in a continuous manner. Thus, planning and control are inseparable on any ground except for the purpose of analysis.

3.2.A The Planning Function:

Change and economic growth bring opportunities, but they also bring risk. It is the task of planning to minimize such risk while taking advantage of opportunities. Planning is considered to be the most basic function of management. Terry defined planning as:

the selecting and relating of facts and the making and using of assumptions regarding the future in the visualization and formulation of proposed activities believed necessary to achieve desired results.⁸

Planning is the selection from among alternatives of future courses of action for the enterprise as a whole and for each segment within it, with the view toward achieving the desired objectives. Every manager plans and the performance of his other functions depends on how well he plans. However, the extent of planning varies with the level of management. Top management has a much broader planning responsibility than lower management, yet each level should have definite planning responsibility. Planning is deciding, in advance, what to do, how to do it, when to do it, and who is to do it. It includes both long-range planning as well as annual planning.

Planning involves making choices between alternatives, and thus, it is primarily, if not entirely, a decision-making activity. The planning function, as it is conceived in this dissertation, can be

⁸Terry, op.cit., p. 184.

broken down into the following six stages:

1. Conceiving business opportunities and forecasting business environment.
2. Establishing broad objectives of the firm.
3. Developing formal long-range plans to achieve the established objectives.
4. Developing short-range plans and profit objectives.
5. Developing detailed budgets within the framework of plans.
6. Establishing standards of performance for activities, groups and individuals.

3.2.B The Control Function:

Control, the other basic function of management, has been defined by Argyris as follows:

(1) Continually sensing what is going on throughout the organization at all levels, (2) Continually collecting data on the activities within the firm; (3) Continually analyzing the resulting data; (4) Continually comparing the data with pre-determined standards defined to judge whether the firm is doing well or not; (5) asking line to issue orders (or issuing it themselves) to correct any negative conditions; and (6) sensing the result of the action that starts the control cycle of events over again.⁹

Control presupposes that objectives, plans, policies and standards have been developed and communicated to those individuals having assigned responsibilities. It contributes to the accomplishment of objectives by detecting deviations from plans and standards in time and in a manner to make corrective action possible. An essential ingredient in an effective control subsystem is the existence of a set of organizational responsibilities which have been defined with reasonable clarity and which allow

⁹Chris Argyris, Interpersonal Competence and Organizational Effectiveness (Homewood, Ill., Richard D. Irwin, Inc., 1962), p. 35.

individual members of the organization to define with reasonable precision the areas over which they can exercise control and to see the contribution they are expected to make toward achieving the company's overall objectives. Control is exercised only by the managers responsible for the execution of plans. Thus, it must be designed to reflect organization structure. Effective control requires objective, accurate and suitable standards, against which actual performance can be measured. Efficient control enables managers to manage by the exception principle through attracting attention only to significant deviations. Another characteristic of efficient control is its ability to incorporate sufficient flexibility to remain effective despite over or under attainment of plans.¹⁰

To sum up, Jaedicke observes that:

A survey of the accounting and management literature seems to indicate that the control process is generally thought of in three ways. First, control is sometimes defined as the analysis of present performance in the light of some standard or goal in order to determine to what extent accomplishment measures up to the plan or standard -- An intermediate sort of concept defines control as a process of securing conformity of a plan. This concept holds that after the variance or deviation from the plan is discovered, the next step is to take corrective action -- A third concept of control stresses the idea of information "feedback" That is, data collected as part of the control process might be systematically reported and used in future planning decisions.¹¹

Accordingly, the control function can be broken-down into the following six stages:

¹⁰Harold Koontz, "Management Control: A Suggested Formulation of Principles," California Management Review (Winter 1959).

¹¹R. J. Jaedicke, "Accounting Data for Purposes of Control," Accounting Review (April 1962), p. 181.

1. Measuring actual performance.
2. Comparing actual performance with objectives, plans, policies and standards.
3. Analyzing the deviation from such objectives, plans, policies and standards.
4. Taking corrective actions as a result of the analysis.
5. Following up to appraise the effectiveness of the corrective action.
6. Feeding information back to improve future planning.

3.2.C Decision-Making Process Defined:

A decision may be defined as the choice among alternative courses of action to resolve a specific problem or toward achievement of a particular end. Decisions are made at every phase of the management cycle. Every manager in his daily work faces the problem of choice, whether he is planning or controlling. In other words, though planning at its core is basically decision making, since it involves selection among alternatives to achieve company's objectives, the process of decision-making does not restrict itself only to the planning function, instead it pervades the entire management process.¹²

It is useful, therefore, to define the decision-making process in terms of the following steps:

1. Recognition and defining the problem.
2. Searching for possible and available alternatives capable of solving the problem or achieving objectives.
3. Evaluating sacrifices and benefits of each alternative to arrive at its net value.

¹²H. A. Simon, Administrative Behavior, New York: The Macmillan Co., 1957, p. 1.

4. Selecting the alternative which yields the highest net value as the best alternative.
5. Following up to appraise the effectiveness of the decision taken.
6. Feeding back information to improve future decision making.

In this definition of the decision making process, steps 2 through 4 can be considered mainly in the realm of the planning function, while steps 5 and 6 are in the control function. Step 1 is the tying link between planning and control. Recognition of the problem, in most instances, may be the product of control, while defining a problem may be the start for planning its solution.

3.3 Information Need for Planning and Control:

As indicated above, both planning and control entail decision making. Decisions tend to be more fruitful when they are based upon considered judgment rather than hunches, intuition or guessing. Considered judgment requires the availability of timely and relevant information in the right form. Information for planning and control decisions is diverse and there is no single source of all information required. Planning may require social and political, in addition to economic, information. Economic information may be related to the internal economic considerations of the firm, or related to the external economic environment, local, national and international. Internal economic information includes both quantitative as well as qualitative information. Management accounting has been charged with the responsibility of providing quantitative economic information to management for effective and efficient decision making in both the planning and control functions.

In an interview with the Editor of Management Accounting,

the Secretary of Commerce, Mr. Maurice H. Stans, stated:

there are few areas of top management decision-making which are not influenced by the availability and the quantity of financial information. Almost all business decisions have a direct or indirect effect on the profit potential of the organization, and these cannot be made without adequate financial data.¹³

It is important to emphasize that management informational needs are satisfied by means of the total information system which include all other information subsystems. Management accounting information is provided by one of these subsystems: the management accounting information subsystem. However, for the sake of simplicity we will designate it from now on as the management accounting information system.

3.3.1 Information for Planning:

Management executives need relevant information at each stage of planning. The information leading to the recognition of problem situations often comes through the control system. Searching for alternative courses of action requires information on the structure and processes involved in the particular problem area and on the interaction of this area with other parts of the organization.¹⁴ Evaluating the alternatives involves detailed and explicit considerations of the effects of each alternative on the organization's goals and objectives. It is at this particular stage that quantitative information plays its most important role and where quantitative techniques are applied to convert available "data" to relevant "information" for planning. Management accounting

¹³Editor of Management Accounting, "An Interview with the Secretary of Commerce, Maurice H. Stans," Management Accounting, the 50th Anniversary Issue, June 1969, p. 13.

¹⁴A.A.A. A Statement of Basic Accounting Theory, p. 46.

plays an important role in this stage. Although the final decision must rest with management executives, the management accountant has the responsibility to provide them with a range of the most attractive alternatives. Analysis of expected economic benefits and sacrifices of each alternative is provided through the management accounting system and related special analyses. After management executives have made a decision on which alternative is to be followed, the management accountant still has a very important part in the planning process. He must express the final decision in the form of a financial and operating plan. The plan should include the over-all objectives of the decision, and a budget which shows the results expected from the plan, the resources to be used in carrying out the plan, and the financial effects of such plans on the firm.

3.3.2 Information for Control:

Just as in the planning function, in order to control properly, managers must make decisions from among alternative choices. These decisions should be based on relevant information. One of the most valuable resources of information in this regard is the accounting information system.

To achieve the aim of control, namely to insure conformance of actions to objectives, plans, or goals, information for control must focus both on the action taken and on the selected plans and objectives they are supposed to accomplish. This focus on planned accomplishments provides a framework for the collection of control data. Control is not limited, merely to collecting data relating to the past. The comparison of what has happened with a standard of what should have occurred is of great importance. This comparison is fundamental for control and is the

basis of the principle of management by exception. With a variable environment, the exception directs attention not only to the appropriateness of the action but also to that of the standard as well. The role of predetermined standards in controlling performance in an organization depends largely on the nature of the activities undertaken and on the environment in which they operate.

To summarize this section on management's need for information; the Simon research team found that three types of information, each serving a different purpose often at various managerial levels, raise and help to answer three basic questions: (1) score card question--am I doing well or badly?; (2) attention-directing question--what problems should I look into?; and (3) problem solving question--what are the several ways of doing the job, and which is the best?¹⁵

According to the analysis presented in this section, we can say that information for planning can be best obtained through answering the third question, while control can be served through answering the first two questions.

3.4 The Role of Management Accounting in Planning and Control:

Accounting, as indicated in Chapter I, is conceived as the function of processing quantified economic information. Information processing can be defined as measurement and communication of economic data. Measurement in this definition includes the collection, classification and analysis of economic data of the firm.

Management accounting is charged with the application of

¹⁵Simon, op. cit., p. 20.

appropriate techniques and concepts in processing internal economic data, both historical and projected, to assist the executives of an organization in making rational decisions with regard to both planning and control.¹⁶

An "Accounting Concept" has been defined as "a mental expression" consisting of the characteristics associated with terms such as entity, period, cost, revenue and profit.¹⁷ Carefully defined concepts are useful to the accountant because they define things that he seeks to measure and communicate and enable him to distinguish these things from others that are irrelevant to the purpose at hand.¹⁸ An individual term may have different definitions because different purposes call for different concepts.

When the concept relevant to a purpose has been defined, the next step is to select or to devise practical techniques for measuring and communicating desired information. Accounting techniques are merely ways to implement concepts.¹⁹

In providing the information required by managers, the management accountant has the responsibility of utilizing the most appropriate technology available to produce information. Whenever this requires measures and techniques based on other disciplines, the management accountant must

¹⁶A.A.A. Committee on Management Accounting 1958, The Accounting Review (April 1959), p. 210.

¹⁷Walter B. McFarland, Concepts for Management Accounting, National Association of Accountants, New York, 1966, p. 4.

¹⁸Ibid., p. 5.

¹⁹Ibid., p. 6.

be prepared to use them to discharge his responsibility efficiently.

The techniques which may be used in management accounting are many and various. A complete listing of these techniques is beyond the scope of this dissertation. However, to set practical boundaries, eight techniques were chosen on the premises of their usefulness and applicability as tools to provide information for both planning and control. These selected techniques are not completely mutually exclusive, in the sense of the possibility of applying each separately and independently from the others; instead they are often interrelated and there are overlapping areas between them. As will be seen through the brief description of these techniques some of them may be used jointly to produce a more useful information medium for managerial decision making. They are also interrelated in the sense that, though some of them are basically planning techniques and others are mainly control techniques, most of them are used simultaneously in both planning and control. The eight selected techniques were chosen to represent the most advocated techniques in modern management accounting in current literature. Another reason for their selection is the increasingly relative usefulness as advocated by so many authors.

3.5 Management Accounting Techniques:

The eight techniques selected for this study are: (1) cost-volume-profit analysis; (2) contribution margin reporting; (3) standard costing; (4) operating budgeting; (5) responsibility accounting; (6) capital budgeting; (7) linear programming and (8) network techniques- PERT/CPM. At this point one can say that standard costing, contribution margin and responsibility accounting are mostly control techniques.

Cost-volume-profit analysis, capital budgeting, linear programming and network analysis are basically planning techniques. An operating budget could serve equally both planning and control functions.

A brief description of each of these techniques would be useful at this point. The objective of such description is to provide basic understanding of their meaning, operation and applications. This conceptual framework will provide the yardstick against which current practices of management accounting, obtained through the empirical research, will be evaluated.

3.5.1 Cost-Volume-Profit Analysis

The Cost-Volume-Profit analysis has received increasing recognition during the last twenty years though cost accounting historians trace its evolution to a long time ago. The importance of such analysis was indicated by Gleason more than 20 years ago, in the following quotation:

Although management cannot be the arbiter of which products or models the public will buy in a free competitive market, it should know which products or models carry the most profit margin, which the least profit margin, the effect a proposed reduction in sale price will have on profits; the effect changing volume or mix of products will have on product cost and profits; the breakeven point of operations; and the expected increases in wages or other operating costs. Knowing these facts, able management will endeavor to direct policy so as to realize, as nearly as possible, the mix and volume which will earn the maximum profits from utilization of plant and equipment.²⁰

From the preceding paragraph, it is clear that the analysis of the relationship between cost, volume and profit is one of the management-accountant's paramount responsibilities. The knowledge of patterns of

²⁰Charles H. Gleason, "The Profit-Volume-Relationship," N.A.C.A. Bulletin, July 1, 1947, p. 1330.

cost behavior offers insights valuable in planning and controlling short and long-run operations. The first step in cost-volume-profit analysis is a careful study of the behavior of costs in order to classify them according to their variability with volume into variable and fixed costs. The difficulty, of course, is that not all costs are easily identified as variable and fixed. Actually, costs in the short run fall into three, not two, categories: (1) fixed costs, (2) variable costs, and (3) semi-variable or semi-fixed costs. However, all costs can be varied in the long run. In the short run, the problem of separating costs into fixed and variable components is encountered primarily in connection with the semi-variable category; because it contains a mixture of fixed and variable elements that cause them to react to volume changes but not in proportion to changes in volume.

Some of the methods available for separating both variable and fixed elements include the high-low method, the graphical approach and the formula approach.²¹ It should be emphasized at this point, however, that the company's chart of accounts may not reflect this variable-fixed classification. Often this segregation process is made by separate analyses for specific management executives' requests and left outside the company's books rather than attempting to effect the various classification schemes in the regular accounts.

Cost-Volume-Profit relationships can be studied in two different approaches. The first approach is called the formula method, either by

²¹Illustration of these methods can be found in most management or cost accounting textbooks; for example, see Charles Horngren, Cost Accounting: A Managerial Emphasis, 2nd Ed., Prentice-Hall, Inc. (Englewood Cliffs, New Jersey, 1968).

the equation method or the contribution margin method. In the equation method (Sales = variable expenses + fixed expenses + desired profit) given any three known variables, one can derive the fourth. Contribution margin is the excess of sales revenue over variable expenses. Sales volume, in units, required to achieve any desired level of profit can be figured out according to the following formula:

$$\text{Sales (in units)} = \frac{\text{Fixed Expenses} + \text{Desired Net Income}}{\text{Unit Contribution Margin}}$$

Sales volume, in dollars, can be derived by this formula:

$$\frac{\text{Fixed Expenses} + \text{Desired Profit}}{\text{Contribution Margin Ratio}}, \text{ where contribution margin ratio}$$

is unit contribution divided by unit selling price.

The second approach is the Graphic method; cost-volume-profit relationships are illustrated either on C-V-P graph or profit graph. Exhibit III-2 is one type of C-V-P graph. As indicated in the chart, costs can be plotted along with total revenue to indicate the breakeven point as well as the areas of profitable operations and areas in which loss would be incurred.

The profit-graph is another way of illustrating the relationships between cost, volume and profit.

Exhibit III-3 shows the profit structure based on profit plan data for the period in the profit-graph form. The advocates of this profit graph argue that it is an effective technique in the internal reporting system through which the results of actual performance in comparison with planned operation can be explained.²²

²²William M. Schofield, "An Effective Internal Management Reporting System," Management Accounting (September 1966), p. 17-26.

FIGURE III-2

COST-VOLUME-PROFIT RELATIONSHIP GRAPH

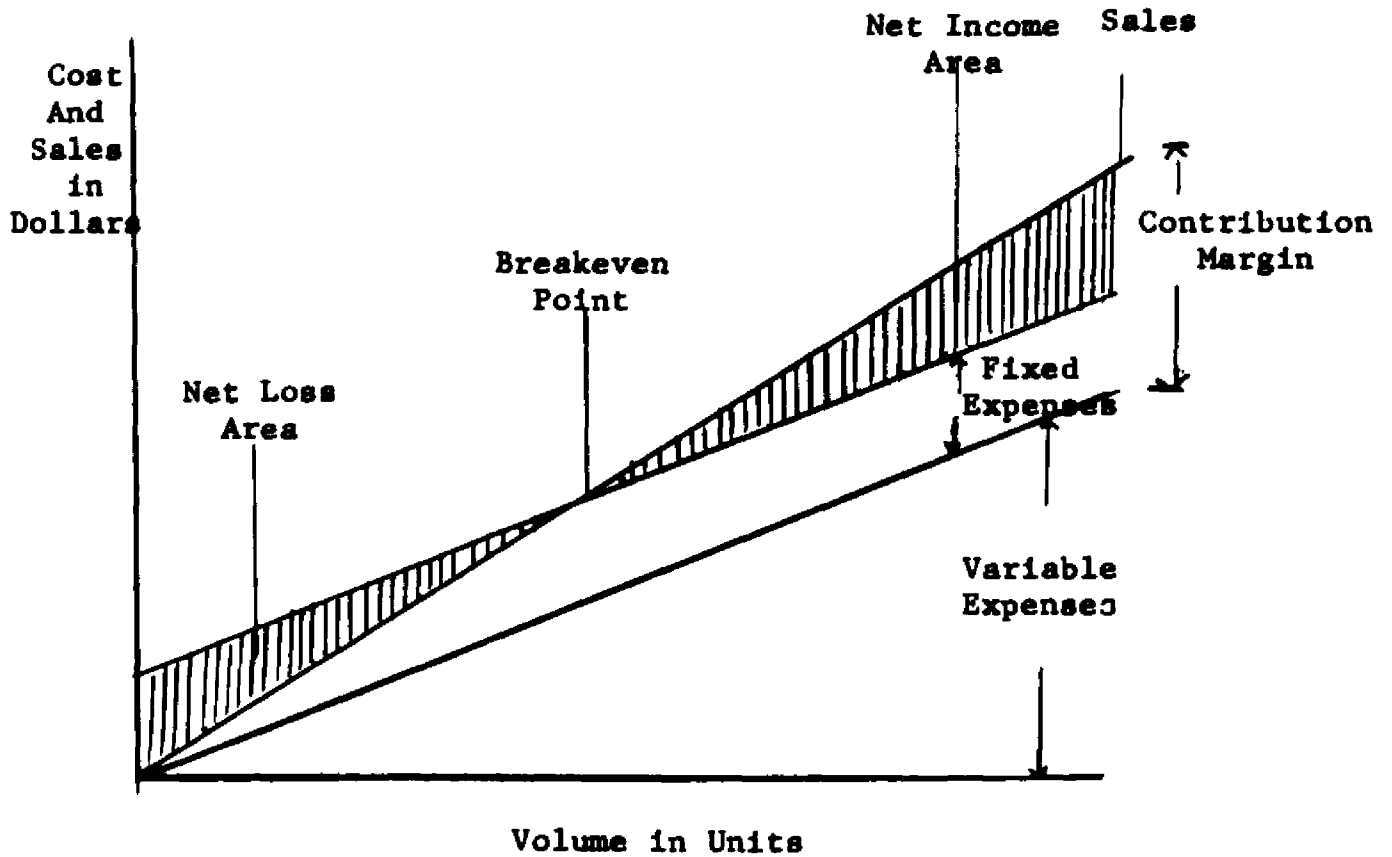
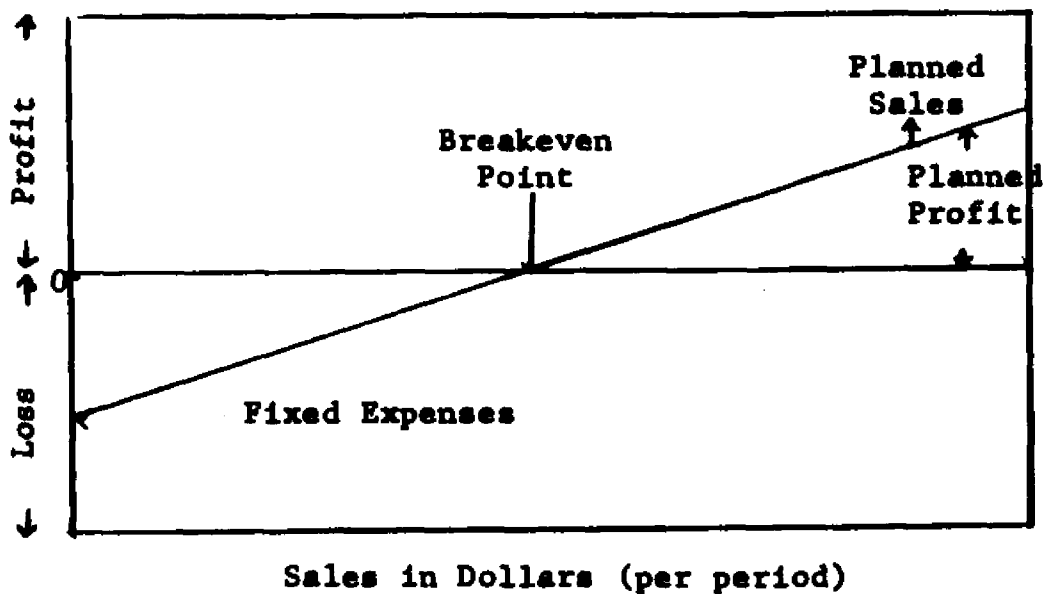


FIGURE III-3

THE PROFIT GRAPH



Cost-Volume-Profit analysis as briefly described above, is based on the following assumptions:

1. The behavior of costs and revenues has been reliably determined and is linear over the relevant range.
2. Costs may be resolved into fixed and variable elements.
3. Fixed costs remain constant over the volume range on the C-V-P chart.
4. Variable costs fluctuate proportionally with volume.
5. Selling prices are to be unchanged.
6. Prices of cost factors are to be unchanged.
7. Efficiency and productivity are to be unchanged.
8. Sales mix will be constant.
9. Revenue and costs are being compared with a common activity base.
10. All factors have been established on a going concern basis.
11. Changes in beginning and ending inventory levels are insignificant in amounts.²³

A whole book is available on the breakeven (cost-volume-profit analysis) as a tool for profit planning.²⁴ In this comprehensive work, the analyses of C-V-P in more than 40 different decision situations were studied. However a more general list of applications would include using this technique to provide useful information for decisions as to (1) pricing and bidding; (2) cost alternatives; (3) sales mix; (4) channels of distribution; (5) addition or deletion of product line; (6) acceptance of special orders and (7) budgeting, specifically establishing the flexible or variable budgets.

3.5.2 The Contribution Reporting Technique

As organizations become more complex, various responsibility centers evolve and multiple products and services are generated inside and outside the organization. One of the most difficult duties of the

²³Horngren, op. cit., p. 48.

²⁴Spencer A. Tucker, The Break-Even System - A Tool for Profit Planning, Prentice-Hall, Inc., Englewood Cliffs, N. J. 1963.

accountant is to devise a convincing scheme for assigning costs to the various segments of an organization. The contribution approach provides a general reporting framework for: (a) operational control - evaluating the performance of a manager, a product group, a sales territory, etc.; (b) product costing and price setting; (c) profitability comparisons; and (d) executive compensation.²⁵

Contribution reporting could be a very useful management accounting technique to alleviate the problems of providing relevant information to the responsible managers in different segments as well as the top management for their decision making. Two major differences between the traditional and the contribution approaches are of importance. Both differences are concerned with cost allocation. The traditional approach of reporting is based on the absorption costing method which does not regard cost behavior as an essential element in income reporting. Internal income statements show net income based on arbitrary allocation of the company's overhead costs. The traditional reporting also emphasizes the functional cost classification; i.e. according to manufacturing, selling and administrative expenses. The contribution reporting approach on the other hand does emphasize the behavior and relevance of cost in reporting operating results of each and all segments of a business concern. A distinction between variable and fixed costs and between separable and joint cost is important for the contribution reporting technique to operate. A separable cost is directly identifiable with a particular segment (i.e. dependent solely on that segment's operations); a joint cost is common to more than one segment and is not clearly or practically

²⁵Horngren, op. cit., p. 300.

allocable except on some questionable basis. Contribution margin reporting technique overcomes the joint costs allocation problem by simply not allocating, i.e. by charging them to organization's performance as a whole, instead of using arbitrary bases for their allocation.

The advantages of the contribution reporting technique have been discussed by many writers. Professor Horngren has argued that contribution margins are superior to the traditional absorption costing method for measuring the effects of utilization of capacity on net income.²⁶ Professor Ferrara has related contribution margin reporting to responsibility accounting and direct costing to answer the question: "what we are measuring a contribution to?"²⁷ Defending contribution margin analysis Dr. Kemp said:

. . .it is illogical to assume that it is possible for company segments to earn a profit or sustain loss, since they are, after all, not dependent operating units but merely parts of the overall enterprise. Thus, if one thinks the situation thoroughly, he frequently comes to the conclusion that the best that can be done to represent segment performance is to reflect a positive or negative contribution made to cover the overall costs and the net income of the business as a whole.²⁸

Another writer, discussing product contribution analysis for multi-product concerns went as far as to conclude that:

What is really significant in pricing decisions is neither cost nor price but rather the present value of the contribution that the product makes toward the recovery of period costs and profit over each product's life cycle. The simulation of

²⁶ Charles T. Horngren, "A Contribution Margin Approach to the Analysis of Capacity Utilization," The Accounting Review (April 1967), p. 254-264.

²⁷ William L. Ferrara, "The Contribution Approach," NAA Bulletin (December 1964), p. 19-29.

²⁸ Patrick S. Kemp, "Contribution Margin Analysis by Company Segment - Three Uses," NAA Bulletin (November 1962), p. 29.

price-cost-volume contribution by life cycle yields consequences which can be anticipated and used in strategic planning geared toward achieving a specific corporate objective.²⁹

3.5.3 Standard Costing

With the management science came the development of industrial production standards for use in both planning manufacturing operations and in later evaluating their actual effectiveness and efficiency. These early standards were engineering or physical standards expressed in methods of operation, units of material and hours of labor. However, it was soon discovered that the same approach could be used in the control of manufacturing costs.³⁰ This process developed in two directions:

1. Translation of physical standards into unit cost standards to be used in accounting for direct material and direct labor costs.
2. Development of budgets (flexible budgets) as a basis for controlling indirect costs which were not controllable by unit cost standards.

Standard costs are defined as "carefully predetermined costs; they are target costs, costs that should be attained under efficient operations."³¹ Physical standards are usually developed by the engineering or operating personnel. In order to be effective, the standards must be accepted by the people whose performance will be, in large part, measured against those standards. Acceptance may be attained through their participation in the process of setting the standards. The

²⁹William S. Kallimanis, "Product Contribution for Multi-Product Pricing," Management Accounting (July 1966), p. 11.

³⁰NAA Bulletin-Research Series No. 9, "Trends in Cost Control Practice," (March 15, 1947), p. 697.

³¹Horngren, op. cit., p. 149.

management accountants price the physical standards and report actual operating performance with the standards.

Three different types of standards can be mentioned here.

"Basic" standard cost provides the base for comparing actual cost through the years with the same, unchanged, standards. "Ideal" or "theoretical" standard costs are the absolute minimum costs which are possible under the best conceivable operating conditions using existing specifications and equipments. "Currently attainable" standard costs are costs that should be incurred under forthcoming efficient conditions.

Management's control of operation is aided through performance reports which include actual costs incurred compared with standard costs, emphasizing unusual variances from standard. The next step in effective cost control is analysis of these variances to pinpoint their causes, along with any personal responsibilities, so that corrective action can be taken. Effective control system usually requires that these performance reports and the analysis of variances be on a regular, formalized basis, which is normally aided by their integration into the budgeting-cost accounting system.

Generally, standard costs provide a framework for (1) gauging performance, (2) building useful budgets, (3) guiding pricing, (4) meaningful product costing and (5) bookkeeping economy.³²

3.5.4 Operating Budget

Budgets are management plans that include all the expected operations and results of a future period. These plans cover all segments of the organization structure of an enterprise. Budgets state formally -

³²Ibid., p. 149.

in terms of expected transactions - the decisions of all levels of management about the resources to be acquired, how they are to be used, and what ought to result. Budgets put the details of management plans for operation in financial terms, so that the results may be projected into expected financial statements. Budgeting, in a broad sense, is any planning, coordinating or control activity related to the development and implementation of a budget.

A Dictionary for Accountants describes kinds of budgets in these terms:

Budgets assume varying forms, depending on the operating methods, scope and complexity of the enterprise. They may be divided into two main classes: (1) capital budgets, directed toward proposed expenditures for project activities, and (2) operating budgets, directed toward planning and controlling program activities.³³

A comprehensive budget is an integrated and coordinated plan for all phases of the operations of the firm expressed in quantitative (mostly financial) terms and summarizing the expected results of the plan in financial terms. By this definition comprehensive budgets would include both operating and capital budgets. Any budget which falls short of this comprehensive budget would be called a partial budget, i.e. does not cover all phases of operation.

A comprehensive budget would include the following sub-budgets:

I. The Master Budget

1. Sales budget with all necessary schedules and sub-budgets
2. Production budget with all necessary schedules and sub-budgets
3. Administrative Expense budget
4. Selling Expense budget

³³Eric L. Kohler, A Dictionary for Accountants, 4th Ed., Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970, p. 67.

5. Capital Expenditure budget
6. Cash Budget

II. Forecasted Financial Statement

1. Budgeted Income Statement
2. Budgeted Financial Position Statement

Any sub-budget may include all the schedules and/or sub-budgets necessary for its operation.

Almost every definition or explanation of budgets includes both the planning and control aspect of the management function. When administered wisely, budgets compel management planning, provide definite expectations that are the best framework for judging subsequent performance and promote communication, motivation and coordination among the various segments of the business.

Support of the top management for the budgeting program and the participation of all members affected by the budget in developing and preparing the budget are two essential factors for its success.

In the remainder of this section, our discussion will concentrate on operating budgets, deferring the capital budget to a subsequent section for separate discussion.

The operating budget can be fixed or flexible. A fixed budget, also referred to as static budget, is a budget which is prepared for a particular level of activity, and is not altered during its life time, even though the actual level of activity during the period proves to be different from the level for which the budget was prepared. A comparison of budgeted revenues and expenses at one level of activity with actual revenues and expenses resulting from substantially different level of activity does not provide a good basis for evaluation and control.

Formerly, this type of budget was quite popular, but currently, the static budget is losing its popularity to the flexible budget.

The flexible budget, also referred to as variable budget, is now generally recognized as necessary for an effective budget program. Most businesses have become more complex and their volume of activity often fluctuates in an unpredictable way. Flexible budgets are prepared in such a way as to provide for meaningful comparisons of actual versus plan at various levels of activity.

Flexible budgets are usually considered most useful in the budgeting of manufacturing overhead (because the volume level is usually readily measurable). However, some theorists are beginning to suggest their use for selling and administrative budgets as well (where volume of "output" is less readily defined and measured).

It should be emphasized here, that the success of budgeting in achieving its objectives depends primarily on the interpersonal aspects of administrative control. It must be accepted and used by members of the firm at all levels of administration and operation. Participation or involvement of all levels of management in the preparation stage of the various budgets is very helpful in committing people to the budgeted objectives and motivating them toward achieving the objectives. Many excellent studies on the human and behavioral aspects of budgeting are available in literature.³⁴

³⁴For example see Chris Argyris, The Impact of Budgets on People, (New York, Controllershship Foundation, Inc. 1952) and Edwin H. Caplan, "Behavioral Assumptions of Management Accounting," The Accounting Review (July 1966), p. 496-509.

3.5.5 Responsibility Accounting

Responsibility accounting is defined as:

A technique of accounting which is tailored to an organization so that costs are accumulated and reported by levels of responsibility within the organization. Each supervisory area in the organization is charged only with the cost for which it is responsible and over which it has control.³⁵

The impetus for development of responsibility accounting and the growing use of it by progressive enterprises, sprang from several sources, among which are: (1) increased complexity of business operations; (2) decentralization of management in attempting to deal with this complexity and to provide a more flexible and dynamic organization structure; (3) the importance of raising productivity and of tight cost control in the current competitive situation; and (4) growing recognition of the vital role of planning and control in the success of business.³⁶

Responsibility accounting depends heavily on fairly specific and precise recognition of the individual supervisor's area of responsibility, as specified by the firm's organization structure.

A clear and precise assignment of responsibilities among the management team is a basic prerequisite for applying the responsibility accounting technique. Such assignment of responsibilities is done through grouping the activities of the company, classifying them into organizational units, be it a production center, a department or a division, and assigning each organizational unit to a supervisor be it a foreman, a

³⁵John A. Higgins, "Responsibility Accounting," The Arthur Anderson Chronicle (April, 1952).

³⁶E. W. Netten, "Responsibility Accounting for Better Management," The Canadian Chartered Accountant (September, 1962), pp. 164-65.

manager or division vice-president. This organization structure is normally charted on an organization chart. Organization charts may be formal ones, specific, published, and known to every member in the organization structure. Or they may be informal, where responsibility-authority relationships are unclear and imprecise. Often every member is able to know who his supervisor is and who he supervises. The essence of responsibility accounting is the accumulation of costs and revenues according to areas of responsibility in order that deviations from standard cost and budgets can be identified with the person or group responsible.³⁷ Implicit in the responsibility accounting technique is the idea that it is appropriate to charge to an area of responsibility only those costs which are subject to the control of the person in charge of each area. The costs which are not controllable by one individual or group are always controllable by another individual or group.³⁸ Practically, however, there are difficulties in assigning responsibility to control cost, because few, if any, elements of cost are the sole responsibility of one person. The following are devised as guides to deciding the appropriate costs to be charged to a person (responsibility center):

1. If the person has authority over both the acquisition and the use of the service, he should be charged with the cost of such service.
2. If the person can significantly influence the amounts of cost through his own action, he may be charged with such costs.

³⁷William L. Ferrara, "Responsibility Accounting - A Basic Control Concept," NAA Bulletin (September, 1964), pp. 11.

³⁸Ibid., p. 11.

3. Even if the person cannot significantly influence the amount of cost through his own direct action, he may be charged with those elements with which the management desires him to be concerned, so that he will help to influence those who are responsible.³⁹

Under the responsibility accounting technique, each supervisor will receive a performance report which includes the summary of cost controlled by levels under his supervision plus the details of the controllable costs charged to his responsibility center. The president's report may include summaries of controllable costs by all levels under him plus details of the corporate office costs which are not controllable except by him.

Responsibility accounting is tied with standard costing and budgeting through its reporting aspect. The performance report submitted to each supervisor would include the actual controllable cost of the responsibility area under that level in comparison with the standard or budgeted cost, showing the variances between expected and actual performance subject to that supervisor's control. Professor Ferrara, in one of his articles, through a series of hypotheses, incorporated the contribution margin technique with responsibility accounting, showing that there is no conflict between the two techniques. Instead they can be incorporated together in the management accounting system.⁴⁰

3.5.6 Capital Budgeting

Capital budgeting is concerned with planning and controlling the addition of capital assets, choosing the best way of financing them, and

³⁹"Report of Committee on Cost Concepts and Standards," Accounting Review (April, 1956), p. 189.

⁴⁰William L. Ferrara, "Responsibility Reporting versus Direct Costing - Is There a Conflict?" Management Accounting (June, 1967), pp. 43-54.

evaluating those decisions by review of subsequent results. Capital expenditures involve large amounts of money which will be committed for long periods of time and will affect operations over a series of years. Therefore, specific capital budgeting decisions and capital expenditure-financing budgets typically cover a number of years.

Because of the relatively fixed and often large commitment of funds made in such capital projects, plans and proposals, these expenditures should be carefully examined by management executives and directors. An essential starting point in capital expenditure planning and control is the identification of project proposals consistent with the long-range objectives of the company.

Capital expenditure proposals must be sufficiently specific to permit their identification with plans for expansion and development, cost-reduction, improvement or necessary replacements.

The second step is the evaluation of each capital expenditure proposal. Generally, the evaluation process involves: (1) the technical feasibility and validity of assumptions about production volumes, market potential and engineering consequences, and (2) the financial profitability evaluation. The first step is outside the management accountant's competency. However, management accountants do assist management executives in the financial aspect of choosing the best feasible proposal(s).

A number of different approaches or investment criteria are used, all of which involve careful selection of relevant (prospective) financial (cost and revenue) data. Among these approaches are the following: (a) the payback period; (b) average rate of return; (c) the investor's rate of return on investment (ROI); and (d) net present value of cash flows.

a. The Payback Period Method. This is the simplest and probably the oldest method used in analyzing proposals of acquiring or replacing fixed assets. The purpose of this analysis is to determine how long it will take to recover the investment through profits (contribution margins) to be earned or costs to be saved resulting from the use of such equipment. Generally, companies using this method adopt decision rules for approval of projects in terms of the number of years required to recover the investment; the shorter the payback period the more advantageous is the investment. Briefly stated the advantages of the payback period are: (1) simplicity of computation; and (2) sensitivity to liquidity risks. However, the basic disadvantages of this method are: (1) its failure to consider the earnings after the initial outlay has been recovered; (2) its undue emphasis on liquidity; (3) failure to recognize capital obsolescence or wastage and (4) failure to recognize the time value of money.

b. The Average Rate of Return (The Accounting Method). By this method, the return is computed as the average profit or cost savings per year, after taxes, throughout the life of the project, dividend by the cost.

c. The Investor's Rate of Return on Investment. This approach expresses each project's estimated value as a single over-all rate of return per annum.⁴¹ This rate is equal to the rate of interest at which the present value of expected capital outlays is exactly equal to the present value of expected cash earnings on that project. If the rate of

⁴¹Ezra Solomon, "The Arithmetic of Capital-Budgeting Precisions," Journal of Business (April 1956), p. 125.

return on a project is greater than the company's cost of capital, then the project should be accepted.

d. The Net Present Value Approach (NPV). Under this method the net present value of each project's cash flow is computed, using the company's cost of capital or any other target rate of return chosen by management as a discount rate. If the net present value of a project is positive, i.e. the present value of cash inflow is greater than the present value of cash outflow, the project should be accepted. If net present value of the project is negative, the decision will be to reject the project proposal.

Both the ROI and the NPV approaches overcome the theoretical deficiencies which exist in the payback and the average rate of return methods. They consider the time value of money and the project's whole life performance.

Using some or all of these screening methods would result in accepting the best feasible project proposal available. The planning function would be completed by constructing a capital budget which is the financial expression of the capital expenditure plan. Such budget would show all the financial details for implementing the accepted capital expenditure proposals.

3.5.7 Linear Programming

We have indicated that it is the primary responsibility of the management accountant to use the latest techniques to make the task of decision making by management executives easier and more objective. Linear programming is one of these techniques which has been developed sufficiently for practical use by accountants and business managers in

general.⁴² There are other "operations research" techniques that are in use besides linear programming, particularly statistical techniques, and it might have been possible to list them here. But linear programming is one of the best known, and is widely employed in one form or another; it is taken as a surrogate for a class of non-traditional techniques. If a firm has reached any degree of mathematical sophistication, it will almost certainly be familiar with this technique, even if not with others.

Linear programming is a mathematical technique by which the best (optimum) solution is chosen from among various alternatives. It is an effective technique for computing problems that have interacting variables, which essentially involve selecting the combination of resources that maximizes profits or minimizes costs. The primary application of linear programming is in the general class of allocation problems.⁴³

All explicit analytical methods of linear programming are based upon certain assumptions. The two central assumptions are (1) linearity and (2) certainty. Linearity means that all problem relationships can be expressed in the form of linear equations. The term certainty indicates that no significant variations are expected in the numerical value of a problem factor.

The mathematical computational procedures of linear programming depend on which of the several programming methods is adopted for a particular problem. The basic or general case is called the Simplex

⁴²Robert B. Sweeny, "Business Use of Linear Programming," Management Accounting (September 1965), p. 39.

⁴³R. Stansbury Stockton, Introduction to Linear Programming, Allen and Bacon, Inc. (Boston, 1963).

method, since it is based upon the simplex algorithm. Another, a graphical method, is limited in application to certain types of elementary two-dimensional problems. The suggested procedure for the graphical method is as follows:

1. Determine the objective function. Usually this takes some form of either maximization of profit or minimization of cost.
2. Determine basic relationship in the situation, especially the constraints.
3. Determine available feasible alternatives.
4. Compute the optimum solution.
5. Modify the solution to take account of those factors in the problem that are not included in the quantitative analysis.⁴⁴

The orderly solution of problems using the simplex format requires the performance of a series of carefully defined steps so as to produce the desired result with minimum computational effort. However, the invention of the electronic computer and its use in business applications overcame this computational problem.

Complex allocation problems having certain characteristics may be solved by a special highly simplified version of the simplex method referred to as the transportation, distribution, or stepping stone method of linear programming. It is especially appropriate for source-to-destination situations such as the transportation of goods from plants to destination facilities. The same solution framework, however, may be applied to a wide variety of problems.

⁴⁴Charles Horngren, Cost Accounting - A Managerial Emphasis, 2nd Ed., Englewood Cliffs, N. J., Prentice-Hall, Inc. 1967, p. 829.

Examples of linear programming applications include: determining optimum product mix, material mixes, machine and manpower combinations, utilizing storage or shipping facilities etc.

Professor Onsi has applied linear programming to provide accounting information to management executives for their decision making process. He has described how the operating budget could be based on a linear programming model to provide relevant, accurate and timely planning and control information for each responsible manager.⁴⁵ He argues that linear programming information is a part of the accounting information system. This view is also shared by other accounting writers.⁴⁶ I believe that if the accountant would like to meet the challenge he is facing by the development and implementation of the modern decision-making techniques, he should prepare himself to apply these techniques in his accounting information system.

3.5.8 The Network Techniques - PERT/CPM

The network technique for planning and scheduling is one of the most interest-provoking developments in recent years. The systems which use network analysis and critical path methods for planning and scheduling the completion of a given task are variously referred to as PERT (Program Evaluation and Review Technique), CPM (Critical Path Method) or PERT/CPM. Although the origin of CPM is industrial and PERT is military, the basic concepts are similar. There has tended to be a merging of the two

⁴⁵Mohamed Onsi, "Linear Programming - An Accounting Information Model," Management Accounting (December 1966), p. 46-52.

⁴⁶For example see Y. Ijiri, F. Levy and R. Lyon, in their "A Linear Programming Model for Budgeting and Financial Planning," Journal of Accounting Research (Autumn, 1963), pp. 198-212.

systems although a distinction which remains is the use of probabilities by PERT and not by CPM.⁴⁷

PERT and CPM both make use of the two basic tools; the network description and the critical path. Together, these tools constitute a single management control technique for defining and integrating events and activities necessary for the timely completion of program activities.

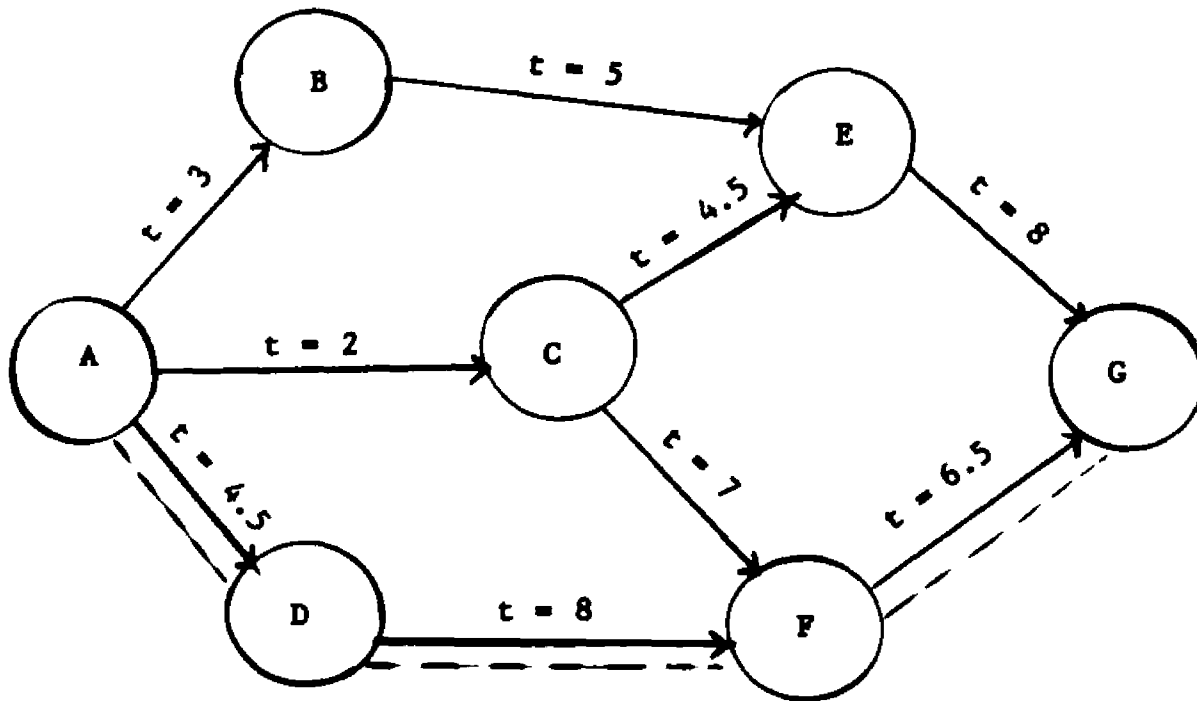
A program or project can be thought of as consisting of a number of specific results to be accomplished in a certain sequence so that an objective may be attained; they are referred to as events.⁴⁸ Events typically are shown as nodes or circles in a network. The activity culminating in an event is described by an arrow. Since the events are interdependent, the arrows also show the sequence in which events must be accomplished. The events, themselves, occur at a point in time; they do not require time. Time is occupied by the activity necessary to proceed from one event to the succeeding one. The network description consists then, of arrows which represent activities and nodes (or circles) which represent events as shown in Figure III-3.

⁴⁷Gordon B. Davis, "Network Techniques and Accounting with Illustration," NAA Bulletin (May, 1963), p. 11-18.

⁴⁸For a summarized text see, A Programmed Introduction to PERT-Program Evaluation and Review Technique by ITT Federal Electric Corporation, John Wiley & Sons, Inc. (New York, 1965).

FIGURE III-3

PERT - NETWORK WITH EXPECTED TIME
AND CRITICAL PATH INDICATED



t = Time ○ Planned Event → Activity - - - - Critical Path

Source: Adapted from An Introduction to the PERT/Cost System for Integrated Project Management, Special Projects Office of the Navy, Washington, D.C.

The next step is to find the critical path through the network. An event is on the critical path if, when it is not completed on time, the entire project is delayed by the amount of time that the event is delayed. In other words, the sequence of events which can not be delayed without delaying the entire project, constitutes the critical path.

The PERT approach to time estimates provides a means for including within the analysis the uncertainty which is part of most time estimates. This is done by obtaining three separate time estimates for each activity - the optimistic, pessimistic and most likely. These

estimates are then used to construct a probability distribution for the occurrence of the events or completion of the activity.

The CPM approach on the other hand, uses a single time estimate. CPM becomes a satisfactory and simpler approach when time estimates are reasonably precise.⁴⁹

Time is the key element in network techniques. It is used as a basis for describing progress and evaluating performance. Cost is not considered in the basic structure. However, a logical extension of the technique is to include the cost element, so as to be able to keep cost low and, at the same time, meet the completion date. Basic PERT(CPM) cost is intended to assist the project managers by assigning costs to the responsibility levels in the detail needed for planning schedule and costs, evaluating schedule and cost performance, and predicting and controlling cost during the operating phase of the program.⁵⁰

PERT/Cost estimates are a new way of looking at the expense budgets. If properly conceived, they can become an integral part of the comprehensive budget program.

In concluding his article DeCoster says:

The accountant is charged by management and society with providing financial information for all levels of decision making. If the accountant is to serve the managers effectively, he will have to broaden his influence beyond the confines of historical data to include all areas of the firm and the future. PERT/Cost offers him one challenge in this direction.⁵¹

⁴⁹Ferdinand K. Levy, Gerald L. Thompson and Jerome D. Wiest, "The ABC's of The Critical Path Method," Harvard Business Review (September-October 1963), p. 102.

⁵⁰Don T. DeCoster, "PERT/Cost - The Challenge," Management Services (May-June, 1964), p. 13.

⁵¹Ibid., p. 17.

This same challenge has induced me to select the network analysis technique to be included among the modern management accounting techniques subject of this study.

3.6 Summary:

This chapter has been divided into two main sections. The first is to explore the role of management accountant in the management process. The second section is concerned with the modern tools available to the accountants which he can utilize to perform his functions; providing timely and relevant financial information to help managerial levels in their decision making process. Every manager in the organization structure is making decisions to plan or/and control the operations under his responsibility. In fulfilling his role, the management accountant as the man most identified with financial information, uses accounting techniques of which eight were selected to provide the needed information for planning and control. Cost-volume-profit analysis, contribution margin reporting, standard costing, operating budgets, responsibility accounting, linear programming and network analysis were chosen for this study. A brief description of each of these techniques is included in the second section of this chapter. This conceptual description will be used as a framework to compare the actual application of these techniques in practice.

CHAPTER IV

THE EXTENT OF APPLICATION OF MANAGEMENT ACCOUNTING IN PRACTICE

In Chapter II, eight management accounting techniques were selected as the scope of this study. Such selection was based on two grounds; (a) their popularity in current management accounting literature, and (b) their purported usefulness to provide all levels of management with relevant information for the planning and controlling functions of management.

In Chapter III, a survey of the management accounting literature was made to provide a conceptual or theoretical description of each of the eight techniques selected. In addition, their prospective applicability to assist management in the decision-making process was introduced briefly.

A survey of the management accounting practices with regard to these techniques, in a sample of thirty-five small and medium manufacturing companies in the State of Michigan, will be the center of discussion of this chapter. The objective of this survey is to show the extent of application of these modern management accounting techniques in today's practice. Discussion based on this survey will start with a synthesis of the objective(s) of management accounting as seen and perceived by the management accountants interviewed for this study. A section on the practice of each of the eight techniques will follow. Finally an over-all view of the extent of application in current

practice will be provided.

At this point, I am presenting only the results of survey data. In Chapter V, there will be discussion of reasons why or why not particular techniques, and the battery of managerial accounting techniques in general are adopted by firms in the survey sample.

4.1 Survey of the Current Practice of Management Accounting Techniques:

This section pertains to the current state of management accounting techniques as they are applied in today's practice as found in my survey. The extent of applying each technique will be investigated. However, the discussion of environmental factors necessary for adopting and applying these techniques will be withheld at this stage to be analyzed separately and in detail in the next chapter.

4.1.1 Cost-Volume-Profit Analysis:

Undoubtedly, business profit depends on a proper balance of selling prices, mix of product, volume and costs. The extent to which a company can achieve a degree of this balance is what determines its profit structure and forms a basis for its future profit planning. Thus, the cost-volume-profit analysis portrays to management what the profit structure of their company is now and what it could become in the future under various proposed alternatives in a way which aids management in selecting the best possible course of action now and in the future.

a. Study of Cost Behavior in Practice:

For the determination of profit at any time, at any volume, at any price level, and for any condition of product mix, proper cost classification and analysis is required. As it has been indicated in Chapter III, some costs vary closely with changes in volume whereas others remain

unchanged in total amounts regardless of changes in sales activity or production volume. Costs which change with volume are usually called variable costs, and those which do not are referred to as fixed costs.

In analyzing the cost-volume-profit relationships, variable and fixed cost components must be separated. The sole determinant for deciding the fixedness or variability of a cost is its behavior with volume. Thus, the first question included in the C-V-P section of the guiding questionnaire was designed to ask each management accountant interviewed whether or not cost behavior has been studied and costs have been classified into fixed and variable in his company. Table IV-1 shows how well the companies included in the sample are doing in determining the variability of costs with regard to volume changes.

TABLE IV-1
NUMBER AND PERCENTAGE OF COMPANIES
STUDYING COST-BEHAVIOR

Cost Behavior	No. of Companies	% of Sample
Yes - Cost behavior studied	23	66%
No - Cost behavior not studied	<u>12</u>	<u>34</u>
Total	35	100%

In twenty three companies, about two-thirds of the sample of the management accountants interviewed indicated that cost behavior has been studied. Cost patterns have been determined and costs elements have been classified into fixed and variable costs. However, about one-third,

twelve of the companies did not study the behavior of their business costs and their cost accounts are left without segregation into their fixed and variable accounts and any attempt to obtain cost elements separated is done in an informal way when need for it arises.

b. The Use of Cost-Volume-Profit Analysis:

The results of the empirical research show that companies interviewed are approximately equally divided on the use of the C-V-P analysis.

TABLE IV-2

DISTRIBUTION OF THE SAMPLE ACCORDING TO THE
APPLICATION OF COST-VOLUME-PROFIT ANALYSIS

Use of C-V-P Analysis	No. of Companies	% of Sample
Yes - We Use C-V-P	18	51*
No - We do not	<u>17</u>	<u>49</u>
Total	35	100%

*with some rounding effect.

Eighteen companies, about 51 percent, of the sample are using Cost-Volume-Profit analysis in their decision making process, either formally or informally. However, seventeen companies, little less than 49 percent, of the sample are not using the C-V-P technique in any form; neither formally, nor informally.

c. The Form of C-V-P Analysis:

Among the eighteen companies that are using the C-V-P technique only 5, 28 percent of them, are reporting the results of the relationships between cost, volume and profit periodically on formal reports to

management and on a continuous basis. The other thirteen companies, about 72 percent of those which are using the C-V-P technique, are using it on an informal basis. Reports illustrating the relationships are made infrequently and according to the demands of top management. This happens each time top management, or a member thereof would feel that C-V-P illustration is needed before taking a specific decision or reviewing the results of specific action.

d. Methods of Analysis and Presentation:

As it has been stated in Chapter III, the relationships between cost, revenue, volume and profit can be presented either by the graphical approach, the formula approach or both of them at the same time. Table IV-3 shows the results of the empirical data.

TABLE IV-3

THE PRESENTATION METHODS OF C-V-P RELATIONSHIPS

Method(s) of Presentation	No. of Companies	% of Sample (18)
Graphical only	2	11
Formula only	11	61
Both graphical and formula together	<u>5</u>	<u>28</u>
Total	18	100%

It is clear, as indicated in the table above, that the dominant method of presenting the C-V-P relationships is the formula method. About 61 percent are using the formula approach only for such presentation.

Twenty-eight percent of the companies using C-V-P technique use both the graphical and the formula approaches combined in presenting C-V-P relationships to management. Only two companies, 11 percent, illustrate such relationships through the graphical approach only. This would indicate the popularity of the formula approach over the graphical approach in current practice of these companies.

e. The Major Applications of the C-V-P Technique:

The companies included in the sample have portrayed varied views on the applications of the cost-volume-profit technique. A list of six broad areas of application was presented to each management accountant interviewed to select those which his company is using. The results are given in Table IV-4.

TABLE IV-4

THE MAJOR APPLICATION OF THE C-V-P TECHNIQUE
RANKED ACCORDING TO FREQUENCY AS REPORTED BY
COMPANIES APPLYING THE TECHNIQUE

Rank	Application	Frequency
1	Pricing and/or bidding (including costing)	20
2	Sales mix (or product mix)	8
2	Budgeting and forecasting	8
3	Addition or deletion of product lines	7
3	Acceptance of special orders	7
4	Selecting channels of distribution	1

Using the technique for product pricing and bidding was cited as the most important application of the C-V-P technique. Both determination

of the most profitable sales mix and the use of Cost-Volume-Profit relationships in forecasting and establishing operating and capital budgets were stated as the second major two applications of the technique. Addition or deletion of a product line or any business segment along with using the technique in accepting special orders to utilize the available capacity came third in order. However, using the C-V-P technique in selecting the best channels of sales distribution was only mentioned by one company and is rated the least used application accordingly.

f. The Relationship between Determining the Company's Cost Behavior and the Application of C-V-P Technique

The empirical results confirm what almost all the textbooks say, that it becomes easier and more probable to apply the C-V-P once the cost behavior has been determined and cost elements have been classified. Among the eighteen companies that apply the C-V-P technique only 14 companies, about 78 percent, have made a study of some sort to determine the behavior of their costs and are classifying their costs into fixed and variable elements. This leaves 4 companies, about 22 percent, who are using the C-V-P technique without making formal cost classification. However, the following characteristics become clear from the empirical data: (1) they all use the C-V-P technique informally; (2) they all use only the formula approach as a basis for cost-volume-profit analysis; and they all but one do not use the graphical method in presenting the C-V-P relationships. Meanwhile, among the seventeen companies that do not use the C-V-P technique, nine companies have determined their cost behavior and their charts of accounts segregate between variable costs and fixed costs. Factors lying behind the inability or desire to apply the C-V-P technique will be

discussed in Chapter V. The relationships observed and discussed in the last two paragraphs are summarized in Table IV-5 below.

TABLE IV-5

RELATIONSHIPS BETWEEN DETERMINATION OF COST BEHAVIOR
AND THE APPLICATION OF THE C-V-P TECHNIQUE

The Relationship	No. of Companies	% of Sample
Companies determine cost behavior and apply C-V-P	14	40
Companies determine cost behavior but do not apply C-V-P	9	26
Companies do not determine cost behavior but apply C-V-P	4	11
Companies do not determine cost behavior and do not apply C-V-P	<u>8</u>	<u>23</u>
Total	35	100%

4.1.2 The Contribution Margin Reporting Technique:

It is important to know the relative profitability of the various segments of the business to guide management toward which segments to emphasize, which to improve and which to drop. Profit analysis applied to different segments of the business can reveal broad areas of strength and weakness in its divisions or departments, products or product lines, job orders, sales territories and salesmen and any other segments of the business.

These strengths and weaknesses are best evaluated by their relative contribution margin toward covering the joint costs and profit. Under the contribution margin technique cost and revenue concepts are those that

differentiate between what can be attached to specific segments and what are joint and are incurred (or earned) for (or from) the business as a whole. In the traditional segment income statements, all costs are fully allocated, so that the segments show final net incomes that can be summed to equal the net income for the company as a whole. The contribution margin reporting technique, on the other hand, realizes the high degree of subjectivity of cost allocation involved in the traditional approach, especially with regard to joint costs where they are not incurred for any specific segment and any allocation of such costs is arbitrary at most. The contribution margin reporting technique distinguishes between various degrees of objectivity in cost allocations and differentiates between separable and joint costs with regard to each segment and reports its contribution margin accordingly.

a. The Use of the Contribution Margin Reporting in Practice

A rather small number of companies are found using the contribution margin reporting technique in practice. The survey shows that only ten companies, 29 percent, are applying the technique as it is defined in this study. This finding is rather a significant one, since it indicates that the majority of the companies included in this study did not yet put this technique into practice.

However, two interesting observations can be seen from analyzing the empirical data collected during the survey. The first indicates a strong relationship between determining the company's cost behavior and the ability of the company to apply the contribution margin reporting technique. Nine companies out of the ten applying this technique, have studied their cost behavior patterns and have classified the fixed and variable elements in their companies' chart of accounts. Only one company

was reported that it determines the patterns of its costs informally and especially for the purpose of reporting the relative performance of its segments.

The second observation reveals the strong relationship between the ability to apply the contribution margin technique in those companies which are already using the C-V-P analysis. Eight of the ten companies that apply the contribution margin reporting are in the same time applying the C-V-P analysis.

The two relationships can be explained on the ground that both techniques, the C-V-P and contribution reporting, need a careful study of the company's cost patterns. Though the C-V-P technique requires classification of costs according to their variability with volume of activity, the contribution reporting requires classification of costs into separable and joint costs. The cost concept differs slightly between the two techniques but awareness and ability to determine the cost behavior according to one concept makes it easier and more probable to determine it according to the second concept.

b. The Segments for which Contribution Margin is Reported:

The empirical findings with regard to the practice of contribution margin reporting indicate that even those companies which apply the technique did not use most of its potential. This observation appears from information illustrated in Table IV-6 below.

As it is illustrated in the table below, no company is analyzing and reporting contribution margin according to more than two classifications of business segments. The majority, 7, companies, applying the contribution margin reporting technique are reporting contributions

TABLE IV-6

BUSINESS SEGMENTS USED FOR CONTRIBUTION MARGIN REPORTING

Reporting Segment(s)	No. of Companies	%
Product lines and job orders only	2	20
Product lines and sales territories only	1	10
Product lines and division (or departments)	1	10
Product lines only	3	30
Divisions (or departments) only	2	20
Job orders only	<u>1</u>	<u>10</u>
Total	10	100%

primarily by product lines. Only one company reports contribution margins according to sales territories. Three companies analyze their contribution by divisions or departments. One company only reports contribution margins by job orders.

c. The Major Objectives of the Contribution Margin Reporting:

Management accountants interviewed have cited at least four major goals for which they are applying this technique. These goals are 1) profitability comparison of various segments of the business 2) product pricing and pricing policy under competitive market conditions, 3) controlling of segments operations and 4) executive compensation.

However, the relative importance of these four goals differs greatly when measured by the frequency of the interview responses and importance attached to each of them as indicated in Table IV-7 below.

TABLE IV-7

THE RELATIVE IMPORTANCE OF THE
CONTRIBUTION REPORTING GOALS

Rank	Objective	No. of Companies
1	Profitability comparison	10
2	Product pricing	4
3	Control of segments' operation	3
4	Executive compensation	1

Profitability comparison of business segments whether it is product lines, divisions, sales territories job orders etc. was cited as the most important goal of the contribution margin reporting. Product pricing occupies the second place of importance measured in this sense. Control of segments operation and executive compensation programs were cited as third and fourth in importance. The accountants feel the profitability comparison is the primary objective of this technique, while the other three uses are secondary and by-products of the first.

4.1.3 Standard Costing Technique:

As it is explained in more detail in Chapter III, standard costs are the scientifically predetermined costs of manufacturing a single unit, or a number of units of product, during a specified period in the intermediate future. Standard costs are the planned costs of a product under current and/or anticipated operating conditions. They should be established as accurately as possible because the effectiveness of controlling and reducing costs and promoting and measuring efficiencies depends on

the quality of the standards.

A survey of the current practice of the standard costing technique reveals several important observations which will be treated separately in the following subsections.

a. The Use of the Standard Costing Technique:

Companies studied for the purpose of this dissertation represent a diverse experience as far as the use of one type of standard costing or another. The number and percentage of those companies which are using standard costing techniques are shown in Table IV-8 below.

TABLE IV-8

DISTRIBUTION OF THE SAMPLE ACCORDING TO
THE USE OF STANDARD COSTING TECHNIQUE

Costing Basis	No. of Companies	% of Sample
Standard Costing	19	54%
Actual Costing	<u>16</u>	<u>46%</u>
Total	35	100%

Nineteen companies, about 54 percent of those interviewed, are applying a costing technique which resembles more or less some of the characteristics of standard costing as it is described in relative detail in Chapter III. On the other hand we found out through the interviews that sixteen companies, about 46 percent, do not utilize any version of the standard costing technique; instead they are still using actual costs for costing their products and valuing their inventories.* Among

*This with the realization that allocation of overhead cost even in the actual costing approach may be based on a predetermined overhead

the nineteen companies using standard costing techniques only fourteen companies use standard cost for all the manufacturing cost elements, material, labor and factory overhead. At least five companies use standard costing techniques on a partial basis. Three of them use standard cost for labor, predetermined or budgeted cost for overhead, but they use actual cost for material. The two companies use standard cost for material, predetermined cost for overhead but actual cost is used for labor.

The standard costs used in practice also differ appreciably on how current the applied standards are. In some companies, standards established as far back as 1951 are still applied today especially for material costing and inventory valuation. A management accountant in one of these companies indicated during the interview that his company uses two different sets of costs for two different decision areas. They use standard labor costs and actual material cost in addition to a predetermined rate for factory overhead, based on standard labor hours, for pricing their products. However, they use 1951 basic standard costs for inventory valuation. In another company, the management accountant interviewed indicated that the material standard cost used in his company has not been changed since 1959. In all the nineteen companies applying standard costing technique, at least five management accountants stated clearly that their standards are basic type of standards as opposed to current standards, and are not updated since a long time. At the same time most of them demonstrated signs of dissatisfaction for having to work according to non-current standard costing system.

b. The Basis of Establishing Standard Costing in Practice:

The success of a standard costing system depends, among other

things, on the reliability and accuracy of the standards to be used in that system. Then extreme care must be taken to assure that all factors have been considered in the establishment of standard costs. Theoretically standard cost has been defined, in Chapter III, as the scientific predetermination of what cost should be in the near future period(s).

Material standard cost consists of price and quantity standards. Labor standard costs consists of rate and time standards. Thus, according to the standard's definition adopted in this dissertation, material price and labor rate standards should be based on expected future prices and rates which are expected to prevail in the period during which these standards are to be applied. Similarly, material usage and labor time should be based on technical engineering studies according to the nature of the products, its production process and the time and motion studies.

Surveying the current practice of the companies included in the study revealed that most of those which apply the standard costing technique rely, in one way or another, on the scientific approach of establishing the standards. However, they differ greatly on the other bases they use to establish their standard costs. This observation is demonstrated in Table IV-9.

In twelve companies, about 63 percent, of those using standard costing, the technical engineering studies approach is used as basis for establishing standards. However, only six of these companies use estimated future costs in addition to the technical engineering studies. Generally, they do this by projecting any foreseeable changes in current prices and rates and incorporating these expected changes into their standards. The standard costs in these six companies completely conform to the standard costs, theoretically defined in this study.

TABLE IV-9

THE BASES OF ESTABLISHING STANDARD COSTS
IN PRACTICE

Standard Cost Bases	No. of Companies	%
Technical Engineering Studies and Estimated Future Costs	6	32%
Technical Engineering Studies and Average Historical Costs	4	21
Technical Engineering Studies and Actual Current Cost	2	10
Average Historical Costs and Estimated Future Costs	3	16
Average Historical Cost Alone	<u>4</u>	<u>21</u>
Total	19	100%

But this theoretical basis is not applied everywhere, and it is not the only basis found in practice for establishing standard costs. Four companies of those using technical engineering studies to establish material usage standards and labor time standards are, in the same time relying on past historical records and are using average past costs as bases for material price standards and labor rate standards. Any deviation of actual costs from these averages would be reflected in material price and labor rate variances. Still, in this category, there are two companies which use technical engineering studies to establish the standards, but cost these standards at actual current costs of material and labor.

On the other hand, the study shows that the other seven companies, 37 percent, that use standard costing, at least by name, did not subject

their operations to any kind of engineering or technical studies. Three of these companies are using a hybrid of average historical cost plus estimated future cost to get what they call standard costs. The other four companies are basing their "standard costs" on merely past historical cost. They do not use engineering and technical studies, nor do they use any sort of expected future costs. But they still have a kind of predetermined cost by which they cost their products and value their inventories. For example, in one of these four companies, labor standards are based on the best performance reported last year. Any deviation from that standard is reflected in some labor cost variances.

c. Analysis of Variances:

Deciding to use standard costing, choosing the bases on which standards are to be established, establishing the standards themselves, and measuring actual performance according to the established standards are but parts of the standard costing technique as perceived here. Comparing actual performance with standard performance is another part of this technique. However, the most important part of all, from the control function point of view, is the determination and analysis of the variances resulting from the comparison between actual and standard performances. Such analysis provides information needed to pinpoint any deviation from the standards, the probable causes for their occurrence and the possible measures necessary to eliminate or reduce such occurrence.

Yet the actual practices of the companies using standard costing greatly vary on how elaborate their variance analyses are. Table IV-10 shows the divergence of the current practice regarding this point.

Eight companies, 42 percent, of those which apply standard costing for measuring performance, costing products and valuing inventories, are

TABLE IV-10

USE OF VARIANCE ANALYSIS AMONG
THOSE APPLYING STANDARD COSTING

Variances Analyzed	No. of Companies	%
Material, Labor and Factory Overhead Variances	8	42%
Material and Labor Variances only	4	21
Labor and Factory Overhead Variance only	2	11
Labor Variances only	1	5
No Variances are Analyzed	<u>4</u>	<u>21</u>
Total	19	100%

using the standard costing technique to its ultimate potential from the control aspect. They determine variances for all the three elements of manufacturing cost, material, labor and factory overhead. However, the number of variances they use for their analysis differs from one company to another. On the one hand, two or more variances were used for each cost element. On the other hand, only one variance was used for each of these elements. In some companies this one variance represents the total variances for a cost element. Still in some other companies, it represents only a part of the total variance of that cost element, absorbing the other part in the measuring process and ignoring it, for the time being, until the end of the financial period.

Four other companies, 21 percent, analyse only material and labor variances during the period, leaving any factory overhead under-or-over application until the end of the period to be adjusted in the books

with or without final remarks on the causes of such variances.

Still two other companies, using standard costing, analyze labor and factory overhead variances only. One of them, is using standard costs for only labor and factory overhead. It applies actual costs to material. It works on job order basis. The other company is using standard costs for the three cost elements, but it analyzes the variances of only labor and overhead.

One other company, in the group, though it applies standard costs to all manufacturing cost elements, considers that labor variances are the only important variances to deserve regular analysis.

However, analysis of the empirical data shows that four of the nineteen companies using standard costs, do not analyze any variances between their actual and standard costs during the physical period, but rather they leave these variances to accumulate until the end of the period when the probable causes may be pinpointed. In this way they lose the possibility of knowing the reasons for these variances shortly after they occur, sacrificing their ability to take any effective corrective action during the period to remedy them.

d. Integrating the Variance Accounts in the Formal Books:

Practices of those companies using standard costs, varied also as to whether or not the variance accounts are included in their general or cost books. Among those nineteen companies, eleven are integrating their variance accounts into the formal books. Their variance accounts are considered regular accounts like any other account. However, the other eight companies consider the variance accounts as special accounts. Variances are accumulated outside the formal books until such date when they adjust their regular accounts by these variances.

e. The Costing System Used in Practice:

Costing systems described in any cost or management accounting textbook are process costing and job order costing. Generally most of the textbooks state the conditions under which each of the two systems could be applied. Theoretically, the textbooks frequently maintain that standard costing is more plausible under the process costing system than under the job order costing system.

The analysis of the empirical results confirms this point. Table IV-11 compares the percentage of these using standard costing technique in a process costing system with the percentage of those using standard costing technique in a job order costing system.

TABLE IV-11
COMPARISON BETWEEN THE PERCENTAGES OF THOSE APPLYING STANDARD
COSTING IN PROCESS COSTING AND IN JOB-ORDER COSTING

Costing System	No. of Companies in the Sample	No. of Companies Use Standard Costing	%
Process Costing Only	17	9	53%
Job Order Costing Only	11	4	37
Hybrid Costing (mixture of both)	<u>7</u>	<u>6</u>	<u>86</u>
Total	35	19	-

One comment is in order at this moment to put the results included in the table above in proper prospective. Most of those companies which adopt a hybrid costing system, though their operations include both process produced products and specially ordered products, the relative weight of

the process operations is more than that of their job order operations.

While 53 percent of those companies which adopt process costing are applying the standard costing technique, only 37 percent of the companies using job order costing are applying the standard costing technique. These percentage would change in favor of those using the process costing if we distribute the hybrid-costing group among the process costing and job order costing groups.

However, the same data does not, at all, indicate that standard costing is only possible under process costing system. To the contrary, two observations became clear through the personal interviews. The first is that standard costing is possible under both process and job order systems, though empirical evidence indicates that it is more probable under process costing than under job order costing. The second significant observation related to this point is that most of those companies which use job order costing use the standard costing in partial, incomplete manner. Some of them use standards for only labor and overhead costs and actual cost for material. Some others apply standard for material and overhead but actual cost for labor.

f. Major Applications of Standard Costing:

Standard costing in practice has been applied to many different decision situations. However, for the purpose of this study only the five applications most repeated by the management accountants interviewed, are shown in Table IV-12. They are ranked according to their relative importance measured by the frequency of answers.

Using standard costs for product costing and inventory valuation was reported by 90 percent of management accountants who apply standard costing, as the most important application of the technique. Control of

TABLE IV-12

MAJOR APPLICATIONS OF STANDARD COSTING

Rank	Major Applications	Frequency %
1	Product Costing and Inventory Valuation	90%
2	Cost Control	74
3	Pricing	68
3	Measurement of Performance	68
4	Building Budgets	52

*Some participants gave more than one answer and therefore, the percentage analysis will total more than 100 percent.

costs through variance analysis was repeated as the second in importance. Utilizing the standard cost of a product as a factor in determining the product's selling price was reported by thirteen companies, 68 percent. Measuring managers' performance was repeated by the same number of companies. Using the standard costs as the block in building operating budgets was reported by little more than half those which apply standard costing and ranked the fourth in importance.

4.1.4 Operating Budgeting Technique:

In Chapter III budgetary planning and control has been defined as the act of preparing and applying budgets in both planning and controlling business operations. A comprehensive budget has been defined as an integrated and coordinated plan for all phases of operation of the firm, expressed in financial terms.

By this definition, a comprehensive budget includes both operating and capital budgets. Operating budget, in turn, could be a comprehensive operating budget covering all and every aspects of operation or it could be a partial operating budget covering only some aspects and leaving other phases of operation not budgeted.

a. Use of Budgets in Practice:

The personal interviews conducted, show that twenty-five about 63 percent, of the companies studied are using budgets in one way or another. Only ten companies, 37 percent, indicated that they did not use any form of budgets yet. Table IV-13 includes the details of current practice with regard to budgeting.

TABLE IV-13

DISTRIBUTION OF THE SAMPLE ACCORDING
TO BUDGETING PRACTICES

Budgeting Practice	No. of Companies	% of Sample
Companies Using Comprehensive Budgets (both Operating and Capital Budgets)	17	49%
Companies Using Only Operating Budgets	5	14
Companies Using Only Capital Budgets	3	8
Companies have no Budgets at All	<u>10</u>	<u>29</u>
Total	35	100%

Seventeen companies, 49 percent of those included in this study are using comprehensive budgeting including budgets for both operations and capital expenditures. Five companies, about 14 percent, establish

and apply only operating budgets. Three other companies indicated through the interviews that they do not apply operating budgets but they do have capital budgets for their future capital expenditures. However, little less than one third, 29 percent, of the companies included in this sample do not apply any budgetary planning and control technique and do not have any kind of budgets in their companies.

In this section we will discuss some characteristics of the operating budgets in practice, deferring the discussion of practice of capital budgeting to a later section in this chapter.

b. The Bases of Establishing Operating Budgets:

Usually, establishing an operating budget for the company as a whole or any segment thereof, starts with setting the objectives for which the budget will be the financial translation. Profit is considered one of the basic objectives of any business. Once a profit objective has been selected, the planning process to achieve such objective starts. Expected profit is a product of expected sales, sales prices, production and costs. Normally, as a starting step in building an operating budget, a study of sales forecast takes place to determine sales projection or expected sales. Then production is coordinated with the sales projection to build the production subbudget with all the schedules of production requirements, material, manpower and services. Selling expenses and administrative expenses subbudgets are established accordingly. Cash budget is prepared from the information included in these subbudgets to find financial sources to support the expected operations. Then forecasted financial statements will summarize the results of operations and shows the budgeted financial positions at the end of the budget period.

This procedure for preparing operating budget was also the normal procedure of most of the companies applying the operating budget technique in practice. However, the management accountants interviewed, in at least two companies, indicated that sales is not the crucial limiting factor in their business operations, and thus they do not base their operating budgets primarily on their expected sales. In fact, they said, one of the problems they are facing is the backlog of customer orders that are unable to meet. Their productive capacity presents a limiting factor in their businesses and thus it constitutes the starting point in establishing their operating budgets. Sales estimates are consulted, but just for coordinating the various parts of operation together to prepare a coordinated master plan for the whole company.

c. The Extent of Operating Budget Coverage

Operating budgets should cover the whole business in both its horizontal and vertical dimensions. Horizontally, the budget should cover all aspects of operation in the company; sales, production, administration and finance. Vertically, on the other hand, an operating budget should cover every level in the company's organizational structure.

Operating budgets could be established at the foreman or cost center for each center; at the departmental level for each department to include the budgets of all cost centers under its supervision plus its own headquarter budget; at the divisional level for each division to include the budget of all departments under the division's supervision plus its own headquarter budget; then at the company's level to include the budgets of all divisions plus the company's headquarter budget. Of course degree of such detail will depend on the environmental factors which will be center topic of the next chapter.

Throughout the interviews, it appeared that there is no uniform practice with regard to the coverage of the operating budgets now in operation. With respect to the horizontal coverage, most of the companies applying operating budgets could be considered having comprehensive operating budgets. They establish their budgets in such a way to cover every aspect of their operation, including sales, production, administration and finance. Required resources as well as the means to provide these resources are included either in the subbudgets or in supporting schedule.

However, in some other companies, the practice of operating budget is not that comprehensive. Their operating budget could be described at most, a partial operating budget, in the sense it excludes some aspects of operations. In one of those companies operating budget was established for almost every business aspect except the production area. The management accountant realizing the shortage of such budget indicated that this situation is due to the unpredictable nature of their job or business, the production operation could not be completely determined until a job is ordered.

Another example of partial operating budgeting practice was seen in those companies which face no sales limitations. Sales budgets are considered less important and therefore, attention given to their construction and elaboration is limited.

Similarly, current practice of operating budgets indicates variations with respect to the organizational level for which an operating budget is established, as indicated in Table IV-14.

Nine out of the twenty-two companies applying operating budgets, prepare their budgets to cover every and all organizational levels. Five of them, prepare subbudgets for each production center, sales territories-

TABLE IV-14

THE ORGANIZATIONAL LEVELS FOR WHICH
OPERATING BUDGETS ARE ESTABLISHED

Operating Budgets Prepared For	No. of Companies	%
All Levels Starting From Cost Center up to the Company Level	9	41%
Only the Division (or Departmental) Level	<u>13</u>	<u>59</u>
Total	22	100%

department and division before integrating these subbudgets into an overall company budget. Four companies do not classify their sales budgets by sales territories, but they prepare budgets for each production center and each division or department.

On the other hand, the empirical research reveals that thirteen companies, about 59 percent of those using operating budget establish their budgets only for each of their divisions or departments. They do not prepare subbudgets for any organizational level below that.

Companies using operating budgets show lesser variation in their practice with regard to operating budget period. All of them establish an annual operating budget. However, some of them break their budgets by quarters and then each quarter broken by months. The shorter the period covered the more the budget becomes detailed and specific.

d. Participation in Setting the Operating Budget

At this moment, an important point should be emphasized. Budgets and standards do not plan, neither do they control. They are merely tools for planning and controlling operations. People, on the other hand, plan

future operations and exercise control over other people performing these operations. To insure the effectiveness of budget as a tool for planning and control, people affected or judged according to the financial information it includes should participate in setting the budget. Participating in setting the budget commits people who participate in that budget and conjoins the objectives of the budget with their own personal objectives in such a way that achievement of the budget objective would be considered a success for the participants. When budgets work in this sense, they work as a means of motivation rather than as a restrictive handicap for those people affected.

Participation could be real or could be a gimmick which in reality does not carry more than the name. Real participation means that every member in the managerial hierarchy responsible for a responsibility center or a function for which a budget is to be prepared, should actively be involved in the development and review of at least the area under his supervision. This way budgets would be developed from the bottom of the organizational structure up to the top management who formulate the planning objectives and finally coordinate and approves the overall planning program. The management accountant, as the budget committee chairman or budget director has the responsibility of providing the required management accounting information, the technical advising and takes the role of the coordinator who consolidates all plans into a master plan of operation to be presented for review and approved by top management.

Budget participation in today's practice as evidenced through the personal interviews, is to a great extent, at variance from participation as defined above. Generally, participation is practiced on a partial

basis in most companies. Real participation is indicated by few cases. In most companies interviewed the development of the budget start from the top of the organizational structure and proceed downward to the lower levels rather than otherwise. The budget is imposed from above, as some management accountants interviewed indicated. In some cases, consultation with lower levels was done. In some other cases budgets are done even without consultation. All that the operational supervisor will know is that "this is his budget and he must operate according to it." It becomes the basis on which his performance is to be judged.

Twelve companies let their middle management members participate in one way or another, in addition to top management and management accounting representatives to develop the operating budgets. However, in the other ten companies, middle management is not allowed to be involved in the development stage of the operating budget. Rather, the budgets are established by top management with the management accounting representatives help and then imposed on the operating people from above.

e. Flexible Budgets in Practice:

The operating budget discussed above, includes expected sales and production with the related expected revenues and expenses. When budget is used as a control tool, the actual performance of sales, production, revenue and expenses is compared against the budget. This budget may be static in nature, in the sense that a projection of sales or production activity level is projected and all other subbudgets are established according to this one level. It is also called the fixed budget. The danger of such rigid budget comes once the expected volume is not materialized and a higher or lower volume is realized. Then the comparison between actual and expected performances becomes ineffective,

and in fact, misleading. Because the comparisons, in such case, will be between two sets of figures which are based on two different levels of activity. As one management accountant put it:

"....because it is a fixed budget not a flexible budget it loses its effectiveness. It is a tool to keep an eye on sales, but it does not give us a tool for controlling operation once sales fluctuates beyond expectations, and it usually happens...."

The flexibility budget (also called variable budget) came into being to remedy this deficiency of the static budget. It is an effective technique that may be utilized to relate budgeted performance, especially budgeted expenses to various levels of activity in a cost center, a department, a division, or the company as a whole.

The number and percentage of the companies using the flexible budgeting technique is shown in Table IV-15 below.

TABLE IV-15
THE EXTENT OF THE FLEXIBLE BUDGET
IN PRACTICE

Type of Budget	No. of Companies	%
Flexible (Variable) Budget	8	37%
Static (Fixed) Budget	<u>14</u>	<u>63%</u>
Total	22	100%

The results of the interviews lead one to believe that the flexibility concept of the operating budget technique is still not widely spread in the budgeting practice of the small companies. Only eight companies, 37 percent, of those using operating budgets are applying the

flexible budgeting technique in establishing their expenses budgets. However, fourteen companies, 63 percent, do not use the flexible budgeting technique, rather they use the static budgeting instead.

f. The Major Advantages and Application of Budgets

Management accountants who are using operating budgeting technique cited that budgets can serve as an effective tool in the following:

1. planning the future course of a business or a sector thereof. Budgets formulate expected performance, they express managerial targets. Without such targets, operation lacks direction and future problems are not foreseen.
2. Controlling operation and responsibility center by comparing the actual performance with the budgeted or expected performance. Any significant deviations are analyzed and causes for such variances can be found. Timely corrective action can be taken either by improving performance, budgets or both. However, this control aspect of the operating budget is most effective when the flexible budget is used.
3. Budgets were also cited as a means of communication in the business. It communicates the business objectives and targets to all levels of management. Where real participation is exercised during the development stage of the budget, it serves as a means of communication in both ways from the bottom of the organizational structure up to top management and from top management down to the lowest affected by the budget.

4. Motivation was also cited as one advantage of using budgets. It is most apparent where real participation in establishing the budget takes place. According to the literature on participative management, people sharing the responsibility of preparing the budget and setting the business targets are motivated to achieve such targets and to meet the budgeted performance.

The importance of the operating budget advantages or applications as measured by the frequency of answers chosen by management accountants interviewed, is indicated in Table IV-16.

TABLE IV-16

THE OPERATING BUDGET APPLICATIONS RANKED
ACCORDING TO THEIR RELATIVE IMPORTANCE

Rank	Budget Applications (or advantage)	Frequency of choosing the advantage
1	Control	22
2	Planning	19
3	Communication and Coordination	5
4	Motivation	3

Control of operations appeared to be the most significant application of the operating budget technique. All the twenty-two companies using operating budget apply it as a control tool. Planning comes in the second place as far as budget use is concerned. Nineteen of the

twenty-two companies using operating budget apply it as a planning device in addition to being a control device. In fact only 19 companies indicated that budget is used for both planning and control simultaneously. While three other companies used operating budgets as a tool for control only, none of the companies used it for planning alone.

Five companies consider budgeting as a tool for communication and coordination. Motivation was cited by only three companies, as an advantage of budgeting. This observation indicates the role the operating budgets is taken to play. It still, at least, in these people's view, is a tool of control to greater extent and plays lesser role in both communication and motivation to which the attention has been directed recently.

4.1.5 Responsibility Accounting Technique:

Responsibility accounting technique is defined in Chapter III as a technique by which the management accounting system will be tailored to the organization structure in the company. Costs are accumulated and reported by levels of responsibility within the organization. Performance reports designed according to the responsibility accounting technique are prepared to measure how well a supervisor has fulfilled his responsibilities in terms of the cost and revenue elements under his influence.

Clear and precise assignment of authority-responsibility relationships for all and every member in the organization is very important prerequisite for applying responsibility accounting technique. Without this clear cut in the responsibility boundaries of each supervisor in the organization, assigning cost by responsibility centers becomes a very difficult task, if not impossible. The second requirement to apply responsibility accounting is the choice of the cost concept which best fits this

control technique. The cost concept appropriate for this purpose is to classify cost items into those costs which are controllable by a specific responsibility level to be accumulated and reported to it, and those costs which are not controllable by that responsibility level, and thus, are not reported to that level. Costs which are not controllable by one responsibility level are controllable by some other higher levels in the organization structure and may be reported to them.

a. Clarity of the Organization Structure in Practice

During the survey of current practices of the companies included in this study a guiding question was asked about whether the company interviewed has an organization chart or not and whether this chart, if any, is formal or informal. The aggregated details of the answer to this question are illustrated in Table IV-17.

TABLE IV-17

NUMBER AND PERCENTAGE OF THE EXTENT OF
ORGANIZATION CHARTS IN PRACTICE

Organization Structure Clarified by	No. of Companies	% of Sample
Formal Organization Chart	18	52
Informal Organization Chart	11	31
No Organization Chart	<u>6</u>	<u>17</u>
Total	35	100%

Eighteen companies, about 52 percent, of the sample indicated that their organization structure is specified and illustrated on formal organization charts. Authority-responsibility relationships were clarified

and specific assignment of duties was implied. Eleven other companies, about 31 percent, of the sample, pointed out, that although they do not have formal organization charts, they do have a somewhat clarified organization structure that is maintained in an informal form of organization chart. Authority-responsibility relationships are designated but in a less clear cut way and the existence of some grey areas of responsibility conflict were mentioned during the interviews with the management accountants in these companies.

On the other hand, six other companies, 17 percent of the sample were found to have no organization chart what-so-ever. Authority-responsibility relationships are not clear. The hazard of authority-responsibility conflict is greater than in the other two categories mentioned above. Examples of ambiguity and confusion of the exact responsibilities are indicated by management accountants in this group.

b. Cost Concepts for Responsibility Accounting

The results of the guiding questionnaire shows that only 16 companies, about 46 percent of the sample, classify their costs into controllable costs and uncontrollable costs according to each responsibility center. However, 19 companies, about 54 percent of companies interviewed and included in the sample do not classify costs according to the controllability concept and do not differentiate between controllable and uncontrollable costs.

c. The Extent of Applying Responsibility Accounting Technique

The study, further shows that not all companies which differentiate between controllable and noncontrollable costs apply the responsibility accounting technique. Table IV-18 shows the details of the survey regarding this point.

TABLE IV-18

THE EXTENT OF USING RESPONSIBILITY
ACCOUNTING TECHNIQUE IN PRACTICE

Performance Reports are Prepared in such a way as to	No. of Companies	% of Sample
Report only Controllable Costs to Each Level of Responsibility	10	29
Report both Controllable Cost and Noncontrollable cost to Each Cost Center	6	17
Report Total Absorption Cost to Each Cost Center Without any Regard to Controllability	<u>19</u>	<u>54</u>
Total	35	100%

Ten companies, about 29 percent of the sample, are applying responsibility accounting as it is broadly defined in this study. Their performance reports are tailored to their organization structure, and only controllable costs are charged and reported to each responsibility center.

On the other hand, a majority, 54 percent, of the companies interviewed do not apply the technique. In the performance reports of these companies, cost is charged to each cost center according to absorption costing method without any differentiation between controllable and noncontrollable cost; total cost is reported.

However, an intermediate group is found during this survey. Six companies, about 17 percent of the sample indicated that they classify costs according to their controllability and differentiate between controllable and noncontrollable costs for each responsibility level. But in their performance reports prepared for each of these responsibility centers,

total costs are reported separated into two subgroups: costs controllable by the responsibility level the report is prepared for and costs uncontrollable by him. They base their practice on the idea that in this way each responsibility level is made aware of the total cost incurred in his center. However, it seems to me that this practice is just an intermediate stage between the traditional performance reporting according to the absorption approach and the modern performance reporting according to responsibility accounting technique.

TABLE IV-19

THE EXISTENCE OF ORGANIZATION CHARTS AND THE
APPLICATION OF RESPONSIBILITY ACCOUNTING

Combination of Organization Chart and Responsibility Accounting	No. of Companies
Companies having Formal Organization Chart and Applying Responsibility Accounting	7
Companies having Formal Organization Chart and No Responsibility Accounting	11
Companies having Informal Organization Chart and Applying Responsibility Accounting	3
Companies having Informal Organization Chart and No Responsibility Accounting	8
Companies having No Organization Chart and Applying Responsibility Accounting	0
Companies having No Organization Chart and No Responsibility Accounting	<u>6</u>
Total	35

d. Relationship Between the Degree of Clarity in the Authority-Responsibility Relationship and the Application of Responsibility Accounting Technique

Empirically, it appears that there is a strong relationship between the degree of clarity in the authority-responsibility relationship in the organization structure of a company and the possibility of adopting the responsibility accounting technique in the company's accounting system.

The analysis of the information illustrated in Table IV-19 above indicates the following:

- (1) Seven companies, about 39% of those which have formal organization charts constitute 70 percent of those companies which apply the responsibility accounting technique.
- (2) Three companies, 27 percent, of those which have informal organization chart, constitute the other 30 percent of those who apply the technique in question.
- (3) None of the companies which have no organization chart apply the responsibility accounting technique.

e. The Major Applications or Objectives of Responsibility Accounting

Controlling the operations of each responsibility center, measuring the performance of each supervisor, and motivating the company managerial levels are the three most repeated objectives of the responsibility accounting technique.

However, the interviews indicate that not all the ten companies applying responsibility accounting see these objectives in the same way or assign to them the same importance. Five companies using the technique indicated that it achieves all of the three objectives, control, measurement of performance and motivation. Three other companies used the

technique as a tool for only control and measurement of performance. Another company used as a device for both measurement and motivation. A last company used it only for control purposes

When these objectives are ranked according to the frequency of responses to measure their relative importance as seen in current practice, control ranks first with all companies using the technique citing it as an objective of this technique. Measurement of responsibility levels performance ranks second with eight management accountants selecting it. Motivation ranks the third with six companies use the technique for it.

4.1.6 The Capital Budgeting Technique:

Capital budgeting is defined as the long term planning for making and financing proposed capital expenditures. Most expenditures for plant, equipment and other long-lived assets affect operation over a series of years. These expenditures, usually are large, permanent commitments that influence the long run flexibility and earning power.

Capital budgeting includes two basic decisions:

1. The first decision involved in capital budgeting is an investment decision; which of the projects or alternatives available to the company should it select and invest its resources in it. There are many approaches or criteria for selecting the best feasible alternative on which the investment decision may depend. Most of the measures of the investment worth are described in Chapter III.
2. The second is a financial decision concerned with from where, how, and when the company will obtain the money required to finance its capital investment decision. This decision involves the financial considerations of which financial

source or combination of sources and which financial institution the company will rely upon to get the required finances. This aspect of the financial decision is beyond the scope of this study. The financial decision also includes long range planning for acquiring and financing the capital investment. The capital budget would serve to translate these long range plans into financial terms.

The capital budgeting technique is defined in this study to include both of the two decisions described above. To make the investment decision without constructing a capital budget is not considered to be applying the capital budgeting technique because every company has to make its investment decision one way or another. The controlling factor here is whether or not the company establishes a capital budget for its capital expenditures.

b. The Investment Decision in Practice

Table IV-20 shows the results of the personal interviews regarding the current practice of the capital investment decision making of the companies included in this study.

The current practice of the companies included in this study indicates that the criteria considered the most theoretically correct to measure the worth of capital investment are the least applied and adopted in practice. Twenty six companies, 74 percent of the sample, cited that urgency and need for the capital expenditure is a factor in evaluating investment worth. It is also considered the most popular measure in practice. However, only three companies of them, use the measure as the sole criterion for deciding whether or not to invest in capital expenditure.

Twenty two companies, 63 percent of sample, indicated that availability of cash necessary to finance capital expenditure is a measure

TABLE IV-20

**THE MEASURES OF CAPITAL INVESTMENT WORTH
APPLIED IN CURRENT PRACTICE**

Investment Criteria	No. of Companies	% of Sample
Urgency and Need	26	74%
Availability of Cash	22	63
Payback Period	20	57
Accounting Average Rate of Return	8	23
Net Present Value	3	9
Discounted Rate of Return on Investment	2	6

on which they base their investment decision. The following is a typical quotation of one management accountant of these companies.

The decision we face is how much money we have and where are we going to spend it. Each departmental manager has to submit a request for capital. Needs are measured against cash resources just for the sake of appropriating cash available to capital expenditure needs according to the degree of urgency.

Again, only three of these companies use the availability of cash criterion as the only justification for investment.

Payback period method for measuring capital investment worth was reported by twenty companies, 57 percent of the sample. Two of these companies do not apply any other measures in addition to the pay back period.

Eight companies, 23 percent of sample, are using the accounting average rate of return to determine the profitability of capital projects. However, none of these companies use this measure alone. They use it in addition to some other measurements of investment worth.

Net present value method, the one considered by many academicians as the most theoretically sound measure of investment profitability has been applied by only three companies, 9 percent, of the sample. All of these companies, are using more than one measure for the investment decision.

Only two companies are applying the discounted or internal rate of return on investment (ROI) measure. One of them is using the net present value and the payback period at the same time to determine the profitability of its investment proposals.

One major observation derived from the results of the empirical data collected on this point, is that most of the companies use more than one measure in making the capital investment decision. Table IV-21 shows the details of this observation.

TABLE IV-21

DISTRIBUTION OF THE SAMPLE ACCORDING TO THE
NUMBER OF INVESTMENT CRITERIA CON-
SIDERED BEFORE MAKING
A DECISION

Number of Investment Criteria	No. of Companies
Only one measure	8
Two measures	12
Three measures	8
Four measures	6
Five measures	<u>1</u>
Total	35

It is significant to note that any of the companies which use the net present value or the discounted ROI use more than one measure for this decision. Even one company of them use five measures, all the measure considered in this study except the availability of money criterion.

c. The Extent of Using Capital Budget in Practice

As we mentioned earlier in this section, every company has to make its decision regarding its capital investments whether they are merely for replacement or for expansion, and whether it uses one measure or more to determine the feasibility and profitability of its decisions. However, not all the companies interviewed fulfill the second part of the capital budgeting technique as it is defined in this study. Only 20 companies, 57 percent of the sample are found using capital budgets in planning their capital expenditures. The other 15 companies, 43 percent of sample, do not establish capital budget for their capital outlays. Seventeen of these companies applying capital budget also apply operating budget at the same time and integrate both budgets in a comprehensive over-all budget. However, three companies use capital budget alone without having an operating budget.

d. Time Coverage and Purposes of the Capital Budgets in Practice

One significant observation, indicated by the results of the personal interviews is concerned with the period the capital budgets cover in practice. Twelve companies, 60 per cent, of those companies establish a capital budget which covers only one year. While only the other ten companies, 40 per cent, use capital budgets which cover a period more than one year. This period ranges between 2 and 5 years.

Capital budgets are used basically for planning capital expenditure necessary for both expansions and replacements. Eighty percent of

the companies having a capital budget use it for both applications. Only 20 percent use it for expansion only.

4.1.7 Linear Programming:

Linear Programming, as stated earlier in Chapter III, is one of a number of quantitative analytical techniques that have proved useful in complex allocation problems. These quantitative methods of problem solving, like many employed in operation research are based upon mathematical and statistical concepts. Much of the credit for demonstrating the applicability of linear programming methods in business problems belongs to those people engaged in operations research. However, many accountants have written on the applications of linear programming in areas where traditional accounting techniques have been used for a long time.¹

The linear programming technique has been selected, for the purpose of this study, from among many operation research techniques, and is taken as a surrogate for a class of non-traditional techniques, on the presumption that, if a firm has ever reached any degree of mathematical sophistication, it will almost certainly be familiar with this technique, even if not with others.

a. Linear Programming in Practice

If the above presumption is true, then we could say, according to what we have found in practice, that the level of mathematical sophistication, among the small and medium manufacturing companies included in

¹ For example, see A. Charnes, W. W. Cooper, and G. Ijiri, "Break-even Budgeting and Programming to Goals," Journal of Accounting Research, Vol. No. 7 (Spring, 1963), pp. 16-43; and Mohammed Onsi, "Linear Programming - An Accounting Information model," Management Accounting (December 1966), pp. 46-52.

this study, is rather very low indeed. Among the thirty-five companies interviewed, only one company reported using linear programming in management decision making process. The other thirty-four companies have indicated that they never used the technique yet. This conclusion should be qualified. Since the personal interviews were conducted with only the management accountants in these companies, there is a possibility that a company has used linear programming in its engineering or research and development departments and that the management accountant does not know of such application. In this case his answer would be a negative one to the contrary of the facts. But, though such a possibility exists, we do not believe that its outcomes would significantly change our conclusion that the degree of mathematical sophistication of the small and medium companies is very low.

In the company where linear programming is used, it was found that the technique is not used by the management accounting department, but rather it has been an operating department -- the engineering department. The company's president, an engineer, used to apply it with the operating people. However, as the management accountant has indicated, the information necessary to apply the technique is provided by his department. The management accountant, an M.B.A. graduate, has indicated that he knows the technique and even sometimes participates with his president in solving a problem by linear programming. But still, the responsibility of applying the technique is located in the engineering department for which the president acts as the head; "it is still the president's toy."

Linear programming is used in this company in the area of production. Finding the optimum product mix, the optimum production scheduling

and machine loading were the three applications the technique was used for.

4.1.8 Network Technique:

Network analysis is used in both forms: PERT (Program Evaluation and Review Technique) and CPM (Critical Path Method). In PERT (or CPM)/Time, a network representing all the individual events and the activities necessary to achieve these events, required to complete a specific project, is constructed. The network is then analyzed to determine which activity or activities are critical, that is, take the longest time.

PERT (CPM)/Cost, an extension of PERT (CPM)/Time, is intended to assist the project managers by assigning costs to the working levels in the details needed for planning and controlling their projects on the basis of time and cost in the same time.

a. PERT (CPM) in Practice:

The analysis of the empirical data indicates that the popularity of PERT(CPM) in current practice is also at a very low level, though it is much higher than that of linear programming. Six companies, about 17 percent of the study sample, indicated that they have used PERT (or CPM) at one time or another. The other twenty nine companies have not used it at any time.

In addition, the application of PERT(CPM) is only made on an occasional basis. The technique has been used when a specific need for its application has arisen. Once the need is fulfilled, the technique is put out of application until another need would arise.

Most of these companies, five of them, used the PERT(CPM) on time

basis rather than cost basis. PERT(CPM)/Time was actually used for scheduling to meet a specific project completion target date. PERT(CPM)/Cost was used by only one company. However, the management accountant of this company indicated that the results of applying the technique were not too impressive, due to the cost estimates which were sometimes "out of line." During the same interview, he indicated that this error was completely due to the unreasonable time and cost estimates rather than to the technique itself.

Another significant observation regarding the extent of applying PERT(CPM) in practice can be mentioned here. The technique was used by most of these companies for only one application and is used only one or two times to date. Only two companies reported that they have used this technique twice in two different applications. The technique is rather new to all companies interviewed.

PERT(CPM) has been used by these different companies in six different applications.

1. Three companies have applied the technique for production scheduling to meet delivery date stated by customers.
2. Another company used CPM to move their large production equipment from an old plant to another location where they have built a new plant, with the least possible interruption of the production process.
3. One other company used the technique to combine two separate plants in one plant after a merger and reorganization operation.
4. The fourth application was reported by one company using the CPM in planning for computer installation.

5. One company has used the technique to plan its products development and marketing.
6. The last application was reported by one company which used the CPM in planning for budget installation and for closing the accounting books.

4.2 The Extent of Management Accounting Techniques in Practice:

In the survey part of this chapter, the extent of applying each of the eight techniques selected for this study, has been analyzed individually in a separate section. The number of companies and percentages of those which apply the technique and those which do not apply it gave us a micro-picture of the practice of each of these techniques.

In this part, we will deal with the extent of management accounting in practice on a macro-basis.

a. Popularity and Acceptance of Management Accounting Techniques in Practice

Table IV-22 shows the eight techniques ranked according to the number of companies, included in this study sample, which apply each technique. This would show the extent of these techniques in practice today.

Analysis of the results of this empirical research reveals that management accounting techniques are not highly popular among the small and medium companies subject to this study. The most applied technique in current practice as evidenced from this research, is the operating budget. Sixty-three percent of the companies interviewed and included in the sample are found applying the operating budgeting technique. However, only 23 percent of the sample apply the flexible operating budget. Capital budgeting, the second most applied in practice, is used by about

TABLE IV-22

NUMBER AND PERCENTAGE OF COMPANIES APPLYING EACH
TECHNIQUE AND ITS RANK IN TODAY'S PRACTICE

Management Accounting Technique		No. of Companies Applying it	% of Sample
1	Operating Budgeting	22	63%
2	Capital Budgeting	20	57
3	Standard Costing	19	54
4	Cost-Volume-Profit Analysis	18	51
5	Contribution Margin	10	29
5	Responsibility Accounting	10	29
6	Network Technique (PERT/CPM)	6	17
7	Linear Programming	1	3

57 percent of sample. Nineteen companies, fifty-four per cent are applying standard costing technique in their management accounting system. Cost-Volume-Profit analysis has ranked the fourth most popular technique practiced. Eighteen companies, 51 percent, are found using CVP technique in their decision making process. Operating budgeting, capital budgeting, standard costing, and Cost-Volume-Profit analysis are considered by many academic authors and writers as the most traditional management accounting techniques. The results of this research study confirms this assertion, though the level of popularity is much less than these academic authors suggest in their discussion on the subject.

There are two newer management accounting techniques which this

study has included, and which the empirical data collected indicated that they are not very popular in current practice. These two techniques are the contribution margin reporting and responsibility accounting. Both of them ranked as the fifth most popular in the current practice. Each of the two technique has been applied by ten companies, 29 percent of the sample.

In this study I have included two techniques which first originated as operation research technique, then gained acceptability and popularity in many decision-making areas. Recently a huge number of articles, on their application where traditional accounting technique use to apply, is available in management accounting literature. These two techniques are Network Analysis and Linear Programming. Practicing these two techniques in the companies included in this research is found to be at a rather very weak level. They are not very popular in current practice of these small and medium companies. However, this popularity differs between the two techniques. Network analysis (PERT(CPM) have been used by six companies, 17 percent, while only one company, about 3 percent of sample, has applied linear-programming. The network analysis is more popular in current practice than linear program though both of them are not very popular.

The distribution of the relative application of the management accounting techniques applied in practice is shown in both Table IV-23 and Figure IV-1 below.

The average company of the sample included in this study is applying only three of the eight techniques selected for this research. As it is indicated in both Table IV-23 and Exhibit IV-1 above, the current practice does not represent a normal kind of distribution. Two companies,

TABLE IV-23

**DISTRIBUTION OF THE RELATIVE APPLICATION OF
MANAGEMENT ACCOUNTING APPLIED IN PRACTICE**

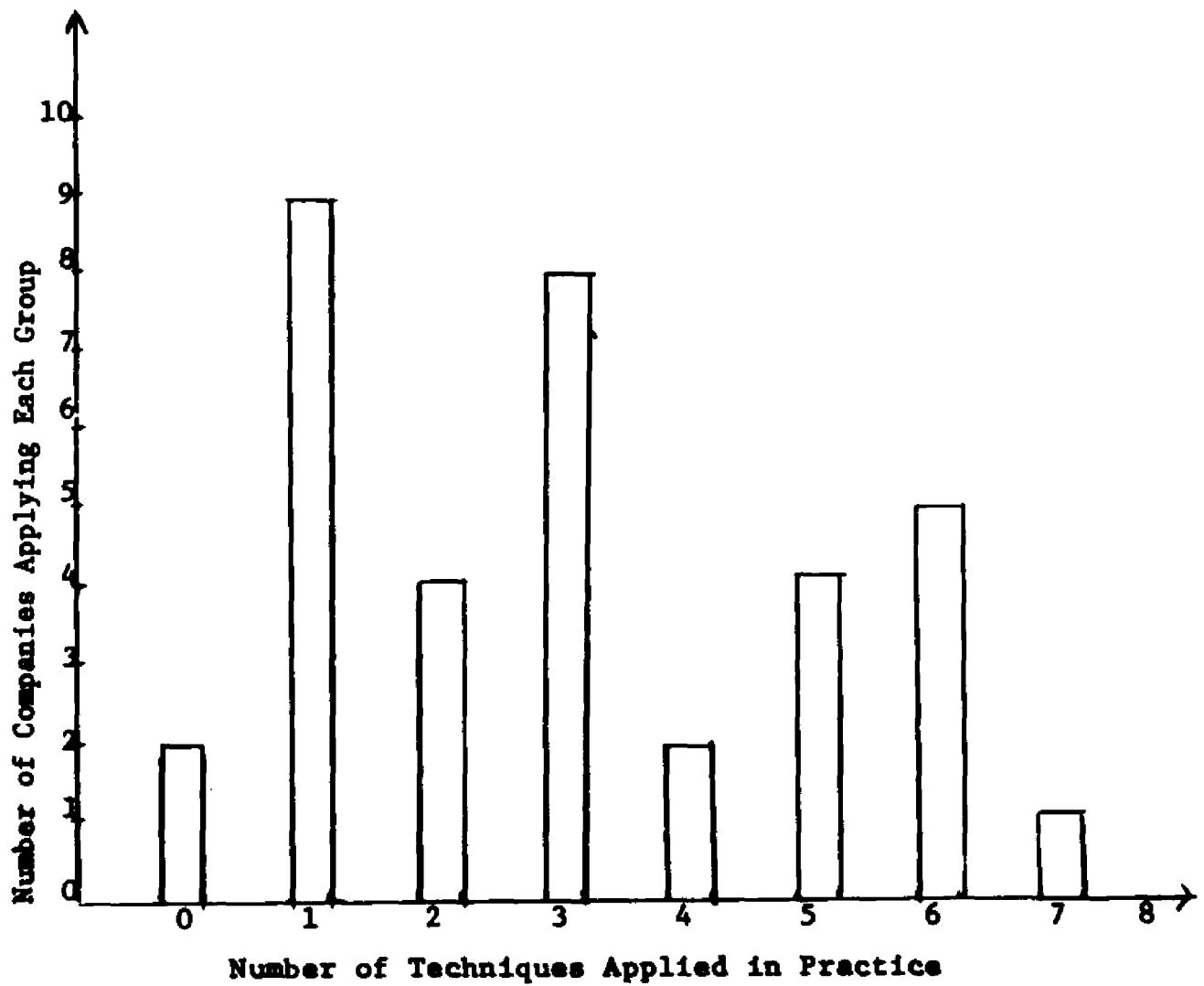
Number of Techniques Used	No. of Companies	% of Sample
Companies Using None of the Techniques	2	6%
Companies Using Only One Technique	9	26
Companies Using Only Two Techniques	4	11
Companies Using Only Three Techniques	8	23
Companies Using Four Techniques	2	6
Companies Using Five Techniques	4	11
Companies Using Six Techniques	5	14
Companies Using Seven Techniques	1	3
Companies Using Eight Techniques	<u>0</u>	<u>0</u>
Total	35	100%

about 6 percent, used none of the eight techniques in their accounting system. Well above one fourth of the sample, nine companies, used only one of the eight techniques. Eleven percent, four companies, are found using two of the techniques in their accounting system. Little less than one fourth of the sample, eight companies used three techniques at the same time. These companies are considered, according to the empirical results of this study, to represent the average companies from applying modern management account techniques point of view.

Forty-three percent of the sample are applying only less than three techniques. However, on the other hand, 34 percent are using four

FIGURE IV-1

DISTRIBUTION OF RELATIVE APPLICATION OF MANAGEMENT
ACCOUNTING TECHNIQUES APPLIED IN PRACTICE



or more of the eight selected techniques. Only two companies use four techniques together in their system. However, four companies were found incorporating five techniques in their management accounting system. The analysis of the empirical results indicates that, five companies, 14 percent, are applying six out of the eight techniques considered. Four of these companies are applying all the six "traditional" management accounting techniques included in this study. One company, however, is applying five of them in addition to one of the quantitative techniques, the network analysis. The maximum number of techniques applied in current practice of the companies included in this sample is seven techniques. However, only one company among the 35 included in the sample, is found applying seven techniques; all the techniques considered except the contribution margin technique. None of the management accountants interviewed, indicated that his company is applying all the eight techniques in their management accounting system.

Another set of observations can be made, at this moment, about the distribution of the management accounting techniques as applied in practice. Considering all the possible combinations of applying more than one technique by more than one company at the same time, we found that only two of such combinations can be observed in the practice of this sample. The first combination is applied by four companies. This combination includes all the techniques considered except Linear Programming and Network analysis techniques. The second combination is applied by three other companies and it includes standard costing, operating budget, and capital budgeting. Beyond that, all the other companies are grouping these techniques in different combinations.

The same analysis shows that only four techniques, each of which is used separately, and by itself, by a number of companies. C-V-P is used only by itself without combining it with any of the other techniques by three companies. Standard costing is used along by another three companies. Operating budget is used in two companies without any of the other techniques. Finally capital budgeting is used alone in only one company.

4.3 Conclusions:

The results of the analysis of the empirical data collected during the personal interviews, led to the following conclusions:

1. Management accounting techniques generally are not widely popular among small and medium companies. The average company in this sample is applying only three of the eight techniques under study.
2. Management accounting techniques taken for this study can be divided into three subgroups as far as the degree of their extent in practice is concerned. Relatively old traditional accounting techniques (C.V.P., Standard Costing and Budgeting), relatively new traditional accounting techniques (Contribution Margin Reporting and Responsibility Accounting), and new quantitative Techniques (Net Work Analysis and Linear Programming). The degree of applying these techniques in practice is related to the relative age of these techniques. More than 50 percent are found applying the relatively old traditional accounting techniques.

While only 29 percent are applying the relatively new traditional accounting techniques. However, a very low proportion apply the quantitative techniques.

CHAPTER V

THE ENVIRONMENTAL CONDITIONS WHICH INFLUENCE THE ACCEPTANCE AND APPLICATION OF MODERN MANAGEMENT ACCOUNTING TECHNIQUES IN PRACTICE

5.1 Introduction:

The extent of the acceptance and application of modern management accounting techniques in the current practice of small and medium manufacturing companies in the State of Michigan, has been shown in Chapter IV of this study. The environmental conditions which tend to influence the acceptance and then the application of these techniques will be the subject of this chapter.

Acceptance and application of management accounting techniques are a product of a complex change process in which many environmental factors, inside and outside a company, take place. These factors or conditions act and react individually and collectively toward or against the acceptance and application of modern management accounting techniques in these firms. Though the relative effect of each of these environmental conditions, taken separately, may differ in direction and/or magnitude, they still work together in the same environment of a business concern and thus they affect everything in it. In this sense management accounting is no exception.

Throughout the empirical research of this study a complete section of the personal interview guiding questionnaire has been devoted to find out the environmental circumstances and causes which enhance the acceptance and application of modern management accounting techniques

acceptance and application of modern management accounting techniques in the practice of those companies included in the study. The questions were also devoted to provide more understanding of those factors which hinder such acceptance and application of these techniques.

In summary, the major environmental conditions which tend to influence the acceptance and application of modern management accounting techniques are as follows:

1. The definition of the function or objective of the management accounting system according to the company policy.
2. The size of the company or the degree of its operation's complexity.
3. The nature and peculiarity of company operation.
4. The top management attitude toward changing the management accounting system or any component thereof.
5. The attitude of the management accountant toward adopting new techniques into his company's accounting system.
6. Availability of the human and physical resources required to carry on the desired change.
7. The relative value of accounting information derived from application of new technique or techniques, as compared to the cost of providing such information.
8. Other environmental conditions such as competition and outside pressure for changing the accounting system.

It is important to emphasize that these factors work in the environment of each business concern. The final decision whether it is toward modernizing the accounting system or against it is a product of all these factors together. Similarity of all conditions but one between two companies may account for the difference in their accounting systems. However, isolating each of these environmental condition and discussing it separately will be just a matter of convenience for the sake of study and analysis, but the fact remains, that they all exist in the environment

of a business and cannot be completely isolated from each other.

5.2 The Function or Objective of the Management Accounting System According to Company Policy and Its Effect on the Acceptance and Application of Modern Management Accounting Techniques

One of the first necessary steps in developing a management accounting system is a clear and precise statement of the objective(s) of management accounting in the company. This statement may be included explicitly or implicitly in the internal company policy. The responsibility of stating such objective may lie on either top management and the management accountant in charge of the accounting function in the firm, or management may give complete authority to its management accountant to state it and then approve it, or it may be dictated by top management and the management accountant becomes responsible only to adopt top management's policy toward the function of accounting.

Regardless of who has the authority of delineating and defining the objective of internal accounting, once such objective(s) is clearly stated, the appropriate concepts and techniques necessary to fulfill it should be selected, accepted and integrated into a management accounting system and applied to provide the relevant information consistent with the objective determined. The type and extent of the appropriate techniques will be governed by the other environmental factors which are taking place at a specific time as well as by the determination of the accounting function.

At the beginning of each personal interview conducted, I asked the management accountant interviewed the following question:

"From the standpoint of your company's policy, what do you believe is the single most important purpose or objective of the management accounting system of your company?"

- a. To provide information for profit planning only
- b. To provide information for control only
- c. To provide information for both planning and control
- d. To keep accounting records for preparing periodical financial statements.

The analysis of the data collected from answering this question is shown in Table V-1 below.

TABLE V-1
THE OBJECTIVE OF MANAGEMENT ACCOUNTING SYSTEM
AS REPORTED IN THE FIELD RESEARCH

Objective of Management Accounting System	No. of Companies	% of Sample
a. To provide information for profit planning only	-	-%
b. To provide information for control only	2	6
c. To provide information for both planning and control	29	83
d. To keep accounting records for preparing periodical financial statements	<u>4</u>	<u>11</u>
Total	35	100%

None of the accountants interviewed has indicated that the single most important objective of management accounting is only to provide information for profit planning. In the same time, only two accountants have stated that according to their company policy, the need for control is the principal factor for the existence of the accounting system employed in their firms. Therefore, in these two companies, the objective of accounting is only to provide information to help management control business operations. Management accounting system is not considered

helpful in providing information for planning. However, further data obtained about the management accounting practices of these two companies does not indicate wide acceptance of modern management accounting techniques appropriate to perform the control part of management accounting function. Each of these two companies is using only one out of the eight techniques considered. In fact one is applying a limited version of cost-volume-profit analysis and the other is using basic standard costing technique. Beyond that, they do not apply any of the modern techniques which are available and appropriate to provide useful information in the control part of the management function.

On the other hand, four accountants in four different companies indicated that the only objective of the accounting systems, in their companies is to keep accounting records to enable them to prepare the periodical financial statements which show the results of operation and the financial position of their companies. Viewing the objective of management accounting as to process financial data for preparing periodical financial statements leads to the conclusion that accounting in these companies is perceived in its financial role rather than its managerial role. Preparation of periodical financial statements and reporting these statements to interested parties is the function of financial accounting as defined in this study. Top management may use the information included in the periodical financial statements to evaluate its own performance in managing the business as a whole, but such a limited viewpoint of the accounting role discounts the needs of the management team at all levels for much more detailed and relevant information (which these periodical statements do not include in ready to use

form) to manage, plan and control the operation of each segment of the business.

The empirical findings regarding the practices of these companies confirm their views with regard to the function of accounting. None of them is applying more than one of the eight management accounting techniques under study. In fact, one of them does not use any of the accounting techniques considered here. Two of them apply only cost-volume-profit analysis and the fourth company uses a partial operating budget. The other management accounting techniques have not been accepted by these four companies. Though their accounting practice is consistent with their objective of accounting, their perception of the function of accounting, in my opinion, is rather narrow and very limited.

The great majority of the management accountants interviewed, 83 percent of the sample, indicated that the most important objective of their management accounting systems, according to companies' policies, is to provide relevant information for both planning and control functions simultaneously and on a continuous basis. The reason for the existence of their management accounting systems is perceived as to assist all management members to manage on an informative and intelligent basis. Management accounting function in these companies, at least in definition, is not restricted only to the financial aspect of accounting. At the same time, these accountants, according to their replies, do not utilize management accounting on a partial basis either to assist only in planning or only in control. But they see it as a function related to the process of managing. Its main objective is to process economic data to help in this process.

However, although the management policies of these companies properly seem to be in agreement on what internal accounting should do, the management accounting practices of these companies exhibit a wide range of difference in their acceptance and application of modern management accounting techniques.

It is clear that the ill-perception or mal-definition of what management accounting should do has a direct effect on the accounting system and the type and number of techniques used in the system. However, the relationship between the proper definition of management accounting and the extent of modern management accounting techniques in practice is not that clear or definite. Data collected for this study shows that companies in this group use 3 management accounting techniques, on the average, as compared to at most only one technique used in the other two groups, those which define accounting as a control tool and those which designate it as record keeping function. But at the same time, analysis indicates that there are other factors, besides the proper perception of what internal accounting should do, that play a major role in the acceptance and application of modern management accounting techniques. The right definition of the function of management accounting is just one of these factors which influence management accounting innovation. Though it is very important, it is just a start on the right road.

5.3 The Relationship Between Size of a Company and the Management Accounting System Employed

The relationship between the size of a company and the type and number of management accounting techniques applied by it, has been tested statistically from two dimensions. The objective of the first test is to show if there is any relationship between the size of a

company as measured in terms of employment, sales, assets, major products and manufacturing departments, and its ability to apply "any" of the eight management accounting techniques subject to this study. The second statistical test is taken to show the relationship, if any, between the size of a company as measured in terms of an average of the five size criteria mentioned above, and the number of management accounting techniques accepted and applied by that company.

The Chi-square statistical test is used in both tests.¹ The hypothesis to be tested in the first test is that the use of any of the management accounting techniques subject to this study is "independent" of the size classification of the company. Acceptance of this hypothesis would indicate that the application of any of these management accounting techniques is possible for any company size and is not dependent on the size of the business concern which applies it. While rejection of the hypothesis means that there is a significant statistical dependency relationship between using any of these techniques and the size of the company.

The hypothesis taken in the second chi-square test is that there is no significant statistical dependency between the size of a company and the number of management accounting techniques applied by that company.

The chi-square formula is programmed on a computer routine designed by a Staff of the Computer Institute for Social Science Research.² Both test were run on the MSU's CDC 6500 Computer.

¹See Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences, McGraw-Hill (New York, 1956), pp. 3-59, and John R. Stockton, Business Statistics, 2nd Edition, South-Western Publishing Co. (Cincinnati 27, Ohio 1962), p. 271-275.

²Alan M. Leagold, Bob Zerby and Glen Foster, Analysis of Contingency Tables - Technical Report No. 141, Computer Institute for Social Science Research, Michigan State University, Revised, July 1969.

5.3.1 The Relationship Between Size of a Company and the Application of Any of the Eight Management Accounting Techniques in Practice

The size of a company has been defined in Chapter II, as a measure of business operation complexity. Companies included in the study sample were classified into very small, small, medium and large according to five size criteria, average annual employment, average annual sales, total assets employed, number of major products or product lines and number of manufacturing departments. Table V-2 summarizes the sample distribution according to each of these size criteria.

TABLE V-2
SAMPLE DISTRIBUTION ACCORDING TO SIZE STANDARD
CLASSIFICATION ESTABLISHED IN CHAPTER II

Criteria Classifications	Very Small	Small	Medium	Large	Total
Employment	1	27	4	3	35
Sales	-	23	11	1	35
Assets	-	21	13	1	35
Products	3	18	10	4	35
Departments	3	12	13	7	35

The chi-square test was run to find out the relationship between the size classified according to each of the five criteria, and the use of any of the eight techniques. Forty contingency tables were produced by this test. Table V-3 shows the χ^2 values as computed by the chi-square formula, compared with the corresponding values obtained from the "Distribution of Chi-square Table" at the appropriate degree of freedom and under

TABLE V-3

**THE RELATIONSHIP BETWEEN COMPANY SIZE AND THE APPLICATION
OF ANY OF THE EIGHT ACCOUNTING TECHNIQUES UNDER STUDY**

Relationships Tested	Chi-Square (Formula Results)	Chi-Square (Table Values) at significance levels		
		10%	20%	30%
D-1 C-V-P and size defined by E*	2.640	6.251	4.642	3.665
	S 1.107	4.605	3.219	2.408
	A 1.097	4.605	3.219	2.408
	P 2.796	6.251	4.642	3.665
	D 1.669	6.251	4.642	3.665
2 Contribution Margin and	E .473	6.251	4.642	3.665
	S .448	4.605	3.219	2.408
	A 1.256	4.605	3.219	2.408
	P 2.524	6.251	4.642	3.666
	D 2.226	6.251	4.642	3.666
3 Standard Costing and	E 4.815	6.251	4.642	3.665
	S <u>10.313</u>	4.605	3.219	2.408
	A <u>5.745</u>	4.605	3.219	2.408
	P <u>6.614</u>	6.251	4.642	3.665
	D <u>6.774</u>	6.251	4.641	3.665
4 Operating Budgeting and	E 2.797	6.251	4.642	3.665
	S 1.445	4.605	3.219	2.408
	A <u>3.008</u>	4.605	3.219	2.408
	P 2.757	6.251	4.642	3.665
	D <u>4.704</u>	6.251	4.642	3.665
5 Responsibility Acctg and	E 2.651	6.251	4.642	3.665
	S .797	4.605	3.219	2.408
	A 1.256	4.605	3.219	2.408
	P 2.524	6.251	4.642	3.665
	D <u>9.939</u>	6.251	4.642	3.665
6 Capital Budgeting and	E 3.392	6.251	4.642	3.665
	S 1.171	4.605	3.219	2.408
	A <u>4.188</u>	4.605	3.219	2.408
	P .859	6.251	4.642	3.665
	D <u>4.693</u>	6.251	4.642	3.665
7 Linear Programming and	E <u>4.753</u>	6.251	4.642	3.665
	S .373	4.605	3.219	2.408
	A .190	4.605	3.219	2.408
	P .766	6.251	4.642	3.665
	D 1.958	6.251	4.642	3.665
8 Network Analysis Techniques and	E .683	6.251	4.642	3.665
	S <u>4.121</u>	4.605	3.219	2.408
	A <u>1.621</u>	4.605	3.219	2.408
	P 2.118	6.251	4.642	3.665
	D 1.918	6.251	4.642	3.665

* E = Employment; S = Sales; A = Assets; P = Products, and D = Departments

three different levels of significance. This comparison is made for each of the eight techniques by each of the five size criteria. Significant values are underlined in the table.

Analysis of the results of this test indicates the following observations:

1. Generally, with only two exceptions, the null-hypothesis of this test is to be accepted at a significance level up to 10 percent. In other words, data collected during this study indicates that statistically there is no significant dependency relationship between the size of a company measured, in terms of any of the size criteria chosen, and the application of any of the techniques under study except standard costing and the responsibility accounting techniques. A company of any size may apply any of the other six techniques after adapting the technique to its own operation.
2. With regard to standard costing, the results of the test reject the null-hypothesis indicating that application of the technique is statistically dependent on the company size, 90 percent of the time. In fact, this conclusion holds true even at 99 percent when size is classified according to the average annual sales criterion. However, such strong relationship does not hold when company size is defined by average annual employment. The conclusion will be true only at 80 percent of the time, i.e. at 20 percent significance level.
3. Both the cost-volume-profit analysis and the contribution margin reporting techniques are found to be statistically

independent of the company size at significance levels up to 30 percent, which means that there is no significant relationship between the probability of applying these techniques and the size of a business concern.

4. The relationship between application of responsibility accounting technique and the company size is found to be statistically insignificant when size is measured by employment, sales, assets or products. However, when size is measured according to the number of manufacturing departments or major manufacturing organizational segments in a company, the result of the chi-square test shows that there is a significant relationship between size measured in this sense and the application of responsibility accounting even at 2 percent significance level. In other words, the application of this technique would depend on the size of the company 98 percent of the time when size is measured according to organizational complexity.
5. The relationship between company size and each of the operating budget, capital budget, linear programming and network analysis is found to be statistically insignificant at up to 10 percent significance level when size is measured by any of the five criteria. However, the results of the test indicate a weaker relationship between size measured by one or two particular criteria and the application of these techniques but at 20 percent significance level. Such level of significance is regarded by statisticians as rather high, since there is 20%

probability that the conclusion will not hold. This implies that the relationships are not that determinate. At 20 percent significance level, the application of operating budget and capital budgeting are related to size defined according to total assets employed or number of manufacturing departments. Linear programming is found to be related to the number of employees. Net-work analysis is related to average annual sales volume. But again, it should be reemphasized that such relationships are at a rather high significance level and thus they are less significant than the relationships which exist between standard costing and responsibility accounting and the size of a company.

These statistical results may seem contradictory to the views of some of the management accountants interviewed who claim that size is one of the major environmental conditions which influence the application or non-application of any of these techniques. Table V-4 shows the number of management accountants and percentage of those who do not apply the technique because of their company size.

The following are some of the typical comments given by the accountants with regard to why not a specific company is not using a specific technique.

One management accountant expressed his views by saying:

"We do not feel that the C-V-P technique is applicable to our size... Our average job-order is \$45.00. We are price followers. It would cost a lot more to apply the technique on such small scale than it would give in terms of more relevant information for decision making..."

Another comment on the application of contribution margin reporting says:

TABLE V-4

NUMBER AND PERCENTAGE OF MANAGEMENT ACCOUNTANTS INDICATING
THAT SIZE IS A FACTOR IN DETERMINING THE APPLICABILITY
OF MANAGEMENT ACCOUNTING TECHNIQUES

Management Accounting Techniques	No. of Accountants	% of Those Who Do Not Apply The Technique
Cost-Volume-Profit Analysis	3	19%
Contribution Margin Reporting	5	20
Standard Costing	2	13
Operating Budget	3	22
Responsibility Accounting	5	20
Capital Budgeting	4	27
Linear Programming	7	20
Network Analysis	4	14

"....because this is a small company, the relationship between management team is still on personal basis....the president still have access to first hand information....he is able to figure out what he needs on a rough form even before complete accounting data are accumulated in the controller's office...."

A typical comment on standard costing:

"....I keep considering the application of this technique, our company is getting larger over time....the time will come when I will not be able to keep my fingers on everything....then we will need controls....and will use standard costing...."

As to the reaction of those who are applying a specific technique the next three comments are typical.

"....we used operating budget as a result of our growth....the company was expanding....broadening its product lines...."

"we have not been budget conscious for very long, because we were a small company, and the larger the size the company becomes the more budget conscious its people get...."

"....we reached the point where capital commitments became so great that managing capital investment became necessary.... then we used capital budgeting...."

Though the statistical results may seem to contradict somewhat with the views expressed in the above comments about the effect of size on the application of any of the management accounting techniques under study, it seems to agree with the conclusion of a major study conducted on budgeting. Sord and Welsh concluded their study with the following remark:

....the diversified types and size of companies revealed by the survey as using budgets or operating plans of specific nature demonstrates the fact that budgeting can be adapted to fit the planning and control needs of practically any type and size of business....³

However, to put this conclusion in the proper perspective, we must emphasize two facts about the scope of Sord and Welsh study;

- (1) Most of the companies included in the survey lie in larger sizes than those included in this study. Ninety four percent of the personal interviews were conducted with companies employing 1000 or more employees. While only 9 percent of the companies included in this study exceed the 1000 employees. Eighty two of S & W's study have sales exceeding \$50 million while in this study only 3 percent have exceed that sales level. Then this study is concerned with much more smaller companies than S & W's.

³ Barnard H. Sord and Glenn A. Welsh, Business Budgeting: A Survey of Management Planning and Control Practices, New York, Controller-ship Foundation, Inc. (1958), p. 36.

- (2) No classification of size into small, medium and large had been attempted in their study. They used employment only as size criterion in their personal interviews data, but employment and sales in their mail questionnaire data.

Also the statistical results of this current study confirm the introductory remarks of a study by the American Institute of Certified Public Accountants regarding the applicability of budgeting in small companies. It concludes that budgeting is applicable to any size of business and "...the smaller and simpler a business, the simpler its budget. The larger and more complex a business, the more elaborate its budget."⁴

However, it is very significant to emphasize that the statistical results of this study do not apply only to budgeting but the conclusions derived are applicable to all management accounting techniques subject of this study. Size is statistically insignificant to the applicability of any of these techniques except standard costing and responsibility accounting in the sense mentioned earlier in this section.

5.3.2 The Relationship between Size of the Company and the Number of Management Accounting Techniques Applied by the Company

The second chi-square test is taken to find out if there is any statistically significant relationship between the size of the companies included in the study, and the number of management accounting techniques accepted and applied in practice by these companies. For the purpose of this test the composite size mode of each company is determined as a

⁴Committee on Management Services, Budgeting for Profit in Small Business, Bulletin No. 2 (New York: American Institute of Certified Accountants, 1959), p. 5.

measure of operation complexity. This classification has resulted in 25 small companies and 10 medium companies. There is no large company in the sample when size is taken as the mode of the five size criteria. Coverage of the practices of large and largest companies manufacturing companies is beyond the designated scope of this study.

Table V-5 shows the distribution of the number of management accounting techniques used by each size classification as well as the mean and the standard deviation from the mean.

The analysis of the results of the average number of management accounting techniques used by each size stratum indicates that there "is" a relationship between the average size of a company and the number of techniques it is using. The results show that the small companies are using, on the average, 2.68 techniques and the medium companies are applying 3.90 techniques. However, the standard deviation results decrease the significance of such relationship since it indicates a wide range of dispersion of the performance.

The chi-square test is sensitive to this phenomenon. When the test is applied to the same data, the conclusion derived from its results indicates that there is "no statistically significant dependency relationship" between the size of a company and the number of management accounting techniques used by the company, at any significance level up to 30% which considered to be too high by statisticians. The value of χ^2 computed according to the formula = 8.295 at 7 degrees of freedom. The χ^2 distribution of 10 percent significance level = 12.017, at 20 percent = 9.803 and at 30 percent = 8.383.⁵ This means, statistically,

⁵Ibid., Stokton, p. 625.

TABLE V-5

THE NUMBER OF MANAGEMENT ACCOUNTING TECHNIQUES ACCEPTED
AND APPLIED BY EACH SIZE CLASSIFICATION AND
THEIR MEAN AND STANDARD DEVIATION

Size Class	Number of Management Accounting Techniques Applied										The Mean of the Number of Tech- niques Used	The Stand- ard Devia- tion
	None	One	Two	Three	Four	Five	Six	Seven	Eight	Total		
Small	2	6	4	6	2	3	2	-	-	25	2.68	1.77
Medium	-	3	-	2	-	1	3	1	-	10	3.90	2.38
Total	2	9	4	8	2	4	5	1	-	35	3.03	2.01

acceptance of the proposition that size and the number of techniques used are independent to a high degree.

However, the results from both the mean distribution and the chi-square test taken together indicate that "there is a relationship between size and the number of management accounting techniques accepted and applied, but this relationship is not powerful enough to be statistically significant." This result confirms our main proposition that, though size of a company may influence the nature of the company's accounting system and the type and number of accounting techniques used in the system, the company size is not more than only one condition among others which exist in the environment of each business and which all together affect by one way or another the final decisions of whether to apply a specific accounting technique or not.

5.4 The Relationship between the Nature of Business Operation and the Application of Management Accounting Techniques in Practice

The type of industry to which a company belongs and the peculiar nature of operation in which it conducts its main business were cited by different management accountants, during the personal interviews, as one of the environmental conditions which influence the acceptance and application of a specific technique in practice.

An accountant in a dairy products producing company gave this reason for the application of the cost-volume-profit analysis in his company.

"....in our particular industry (Dairy), we do not sell our products at constant prices. Instead, our prices vary according to the changing economic conditions and trend and strength of competition within our industry. Therefore, we have to continuously consider the effect of the business volume on costs, prices and profit margin to be able to adapt our operation to any change...."

However, this same accountant has given the following reason regarding why responsibility accounting is not applied in his company:

"....it is very difficult to attempt to get actual cost for each responsibility center in our particular operation, because even raw material cost and labor cost are the responsibility of all operating managers and the allocation of these costs to separate responsibility centers encounters a great deal of arbitrary judgement which at best will not please anybody concerned...."

In another company, where the business volume has tripled during the last five years, a management accountant expressed the following comment as one major reason for not being able to apply operating budget in his company:

"....we will apply this technique when we will be enough established and have a more predictable growth pattern. We can not forecast the expected volume of our business for a fairly long period....we are expanding so fast....things are changing so rapidly that no basis can be set for budgeting to operate...."

A third accountant, who is applying the C-V-P technique has expressed the following comment:

"....our total existence is based on bidding on job orders. Particularly now, when competition is at its most, and business is based on marginal pricing...when our volume starts to fall-off, we lower our prices to get enough volume to cover fixed cost and maintain capacity. This technique has proved to be very helpful in this situation because it shows where we can make price concessions and when we will suffer a net loss if we bid lower than specific level...."

In a small frozen vegetable producing company, the accountant has indicated that his company is operating on a seasonal production operation. They used to have idle capacity a part of the year and therefore they do not care very much about applying any of the modern management accounting techniques subject to this study. When one thinks that the application of at least some of these techniques may help management recognize other opportunities to maintain company's

capacity all year round, one can see that the peculiar nature of a business operation may be one factor but certainly it is not the main, nor the only factor which should govern the application of modern management accounting technique to help management even in changing this adverse peculiar nature.

The analysis included in Table V-6 below shows the number and percentage of those accountants who do not apply a technique and have cited peculiarity of business as one of the reasons for their inability to apply it. Standard costing and cost-volume-profit analysis seem to be the two techniques most affected by this condition.

TABLE V-6

NUMBER AND PERCENTAGE OF COMPANIES NOT USING MANAGEMENT ACCOUNTING TECHNIQUES BECAUSE OF THEIR BUSINESS NATURE

Management Accounting Techniques	No. of Companies	Percentage
Cost-Volume-Profit Analysis	4	24%
Contribution Margin Reporting	1	4
Standard Costing	7	43
Operating Budget	2	15
Responsibility Accounting	1	4
Capital Budgeting	1	7
Linear Programming	2	6
Network Analysis	-	-

The analysis of the research data also indicates that there is some difference in the average extent of modern management accounting

techniques between the durable goods and the non-durable goods manufacturing companies included in the study. Table V-7 summarizes the results on this point.

TABLE V-7

THE AVERAGE NUMBER OF MANAGEMENT ACCOUNTING TECHNIQUES ACCEPTED
AND APPLIED BY DURABLE AND NON-DURABLE GOODS MANUFACTURING COMPANIES

	No. of Companies	Average Number of Techniques Used
Durable Goods Manufacturers	27	3.26
Non-durable Goods Manufacturers	<u>8</u>	<u>2.25</u>
Total	35	3.03

Though the average extent of the application of management accounting techniques in the durable goods industry is greater than in the non-durable goods industry, there is quite a range of dispersion of the performance of each major product group within each classification of the industry. The primary metal companies illustrate the highest average of number of techniques used. The Chemical and Allied products companies show the highest average in the non-durable industry. However even within each classification the extent of modern management accounting technique differs from one company to another for reason explained in this as well as previous sections and for reasons that will be discussed in the following sections.

5.5 The Effect of Top Management Attitude on the Acceptance and Application of Modern Management Accounting Techniques in Practice

An exhaustive and extensive study of the behavioral aspects of management accounting is beyond the scope of this study. However, the importance of top management attitude toward change has been expressed as the most important environmental condition influencing the acceptance or rejection of the application of a specific technique or techniques in the management accounting system of a company. More specifically, twenty-four different accountants interviewed have indicated that one or more techniques have not been applied in their companies because of top management's resistance against changing the management accounting system and their negative attitude every time a recommendation to apply a specific technique was introduced.

An attitude has been defined by many sociologists, psychologist, social psychologist and others. Allport has defined attitude as:

"....a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related."⁶

Attitudes refer to the stands the individual upholds and cherishes about objects, issues, persons, groups or institutions. An attitude can not be observed directly.⁷ It denotes a variable within the individual that affects his behavior in a pertinent situation together with other motives operative at the time and the properties of the situation itself. Attitude is inferred from individual's behavior, his words and deeds.

⁶G. W. Allport, in C. A. Murchison (Ed), A Handbook of Social Psychology (Worcester, Mass., Clark University Press, 1935), p. 798.

⁷Carolyn W. Sherif, Muzafer Sherif and Roger E. Nebergall, Attitude and Attitude Change: The Social Judgement - Involvement Approach (W. B. Saunders Co., Philadelphia 1965), p. 18-20, Ibid.

The influence of top management attitudes on the acceptance or rejection of management accounting innovations, is indicated through the personal interviews with management accountants in charge of the accounting systems of the companies included in the study. No attempt has been made to determine or measure the attitude of top management themselves toward change. Rather the analysis in this section represents the management accountants viewpoints regarding the main factors which works with or against innovation in accounting. Table V-8 shows the number and percentage of those companies which do not apply management accounting techniques, mainly, because of the top managements' resistance against changing the accounting system.

TABLE V-8

NUMBER AND PERCENTAGE OF ACCOUNTANTS INDICATING RESISTANCE OF TOP MANAGEMENT AGAINST CHANGE IS THE MAIN CONDITION BEHIND UNABILITY TO APPLY MODERN MANAGEMENT ACCOUNTING TECHNIQUES

Management Accounting Techniques	No. of Companies	Percentage
Cost-Volume-Profit Analysis	8	47%
Contribution Margin Reporting	10	40
Standard Costing	9	56
Operating Budget	6	47
Responsibility Accounting	13	52
Capital Budgeting	7	47
Linear Programming	3	9
Network Analysis	-	-

The analysis of the findings included in the above table, indicates that top management resistance to change is certainly one of the major environmental conditions which hinder the application of at least six of the eight techniques considered. Taking in consideration the frequency of giving this condition as a reason for not applying modern management accounting techniques leads to the conclusion that top management attitude may be the most, though not the only, factor which influence accounting innovation in practice. However, as it is clear from the empirical results included in the table above, top management influence is not clear in the case of the two quantitative techniques, linear programming and network analysis, where there appear to be more influential factors besides management attitude affecting their application. Such factors will be discussed in the next section of this chapter.

The following are some typical comments concerning top managements resistance against change as expressed by management accountants interviewed:

One said:

"....the top management of this company are running it by the (seats of their pants)....most of them are not highly receptive to new changes....most of them do not go to management seminars....they resent any attempt of pointing fingers on them regardless of whether they are performing good or bad...."

Another has commented that:

"....top management is not interested in this technique (flexible budget)....they think it is a waste of time.... I do not agree with them, but I could not do anything about it now....maybe after changing our top management, especially the key people who do not want their performance to be measured and evaluated....then we may be able to apply the technique...."

A third comment:

"....three years ago, there were no financial officers in this company....it was run by the (seats of the pants approach)....it was a family owned company....anything connected to financial data was classified as highly confidential....Effective next week, middle management will be receiving some limited accounting reports for the first time,....Hell, we are not even doing as well as we know how right now. Because of the resistance of various levels of management we have been encountered with...."

Top management attitude toward innovation in accounting may be attributed, among other things, to the age of top management, their technical background especially of the president's, the type of ownership and management awareness of the need for new modern tools to help them in their decision making process:

1. As to the effect of top management age, the following are some of the relevant comments given by accountants interviewed:

"....we had a complete change in management team just two years ago. The previous top management executives were very oldthey resisted change by every means....but with the new younger, more educated executives, we have now, changing the accounting accounting system is a process to which much time and effort is devoted at the present time...."

"....ten years ago, we had an old management team....they were not really sensitive to what was going on....when younger, more aggressive executives had replaced the old management....they needed more detailed analysis....the son of the older president insisted on making these changes when he became the new president...."

"....the owner of this company is an old man....he is not well educated....his hand is usually in the business....his son is an engineer....and the changes are being made by him after the consent of his father....the son has the high card....this is why we started to use new techniques...."

2. As to the technical background of the president, these comments are a typical sample. On the one hand, an accountant has expressed this opinion:

"....our president is sales oriented....he is from the old school of managers....he has a low regard for modern techniques of management....he controls the employees and the company by himself personally quite closely....by the (feeling of the business)....This is why we do not apply new techniques of accounting....he does not believe they are of any value to him...."

"....our president is a chemical engineer....he does not understand accounting....through the years he has made his own information system....he does not follow neatly accounting reports as we understand it...."

On the other hand, another accountant, in a company which is regarded according to this study as one of the leading companies with regard to the extent of applying modern management accounting techniques, has said:

"....our present president was the reasurer of this company before he became the president. At his time, he had initiated the application of most of the modern techniques we are using now....I have just added some improvement over time....we consult together on this matter often.....he appreciates the usefulness of relevant accounting information in the decision making process...."

3. Although specific statistical data about the type of ownership of the companies included in this study has not been sought, because of the scope of the study which concentrates on small and medium companies, the companies in most cases are owned and/or managed by one owner or few owners;....more frequently than not with family relationships. However, the sample includes some publicly owned companies. The pressures on publicly owned companies to apply modern techniques tend to be more than on those which are privately owned. Thus, I have found some companies adopting a technique because management feels that once a company goes public it must apply the techniques to satisfy the public.

4. As to the awareness of the need for new management tools by the top executives and their personality growth, these are some of the accountants comments:

"....we have applied this technique (standard costing) because of top management recognition of the need for more control...."

"....we may use this technique (operating budget) when top management realizes the possible gains from formalized planning of the future of this company...."

"....we are witnessing the results of the management's own personality growth in our organization....they are changing their attitude as a result of their personality growth along with the company growththey are asking for more information....this helped us to introduce some of the new techniques to provide them the desired information...."

The perception of top management of the importance of accounting function appears to be another phenomenon of the management attitude toward the need for modernizing this function. A possible picture of the relationship between accountant and top management is adequately described in the following comment by one accountant interviewed:

"We are pretty important to this company. However, the company's objective is to get the part (the product) out of the door. The accounting department is a kind of follower. Never has management of this company relied a great deal on the accounting department. But we are improving....There was a time when top management did not recognize the controller as a part of the management team. But now he is considered more and more in the management team through the treasurer who is in the executive committee. Therefore, chances of introducing some of these techniques are enhanced every day...."

Table V-9 show a comparison between the relative performance of each company with regard to the number of management accounting techniques it applies and the intensity of management resistance against application of modern accounting techniques.

There appears to be a reverse relationship between the average extent of modern management accounting techniques and the intensity of top management resistance to change the accounting system. In those companies which are applying less than 3 accounting techniques, the average number of times management resisted changing the accounting system is 2.33 times. In those companies which are applying the sample's average (3 techniques), they resisted, their top management has resisted, on the average, 1.62 times. While in those companies who are applying more than 3 techniques, their top management showed a lesser sign of resistance to change, only 0.67 time.

In summary, acceptance and application of modern management accounting techniques becomes more possible when the members of top management

TABLE V-9

NUMBER OF MANAGEMENT ACCOUNTING APPLIED BY EACH COMPANY AND
THE NUMBER OF TIMES TOP MANAGEMENT RESISTED APPLICATION
OF A NEW TECHNIQUE

Company Code No.	C-V-P	Contribution Margin	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budget	Linear Programming	Network Analysis	Number of Techniques Not Applied Because of Management Resistance	Extent of MGT Accounting Techniques
1	X								1	
2									0	
3									0	
4									0	
5	X	X			X				3	
6					X	X			2	
7									0	
8		X							1	
9							X		1	
10		X							2	
11									0	
12									0	
13									0	
14							X		1	
15	X	X		X	X	X			5	
16					X				1	
17					X				1	
18							X		1	
19					X				1	
20	X		X		X	X			4	
21									0	
22									0	
23	X		X	X	X				4	
24									0	
25		X			X				2	
26	X	X			X				3	
27	X	X	X		X				4	
28		X	X						2	
29			X	X		X			3	
30				X					1	
31	X	X	X	X	X	X			6	
32			X						1	
33			X	X		X			3	
34									0	
35		X	X		X				3	
Total	8	10	9	6	13	7	3	-		

Symbols: X = top management resisted application of the technique
 * = Company applying 3 techniques (the Sample Average)
 - = Company applying less than Average
 + = Company applying more than Average

are young than when they are old, when the president has financial background rather than technical one, and when they are composed of career executives rather than entrepreneurial executives.

5.6 The Effects of Management Accountant's Attitude on Management Accounting Innovations:

The attitude of the management accountant in charge of the accounting system in a company, constitutes, without much doubt, one of the major environmental conditions which influence the innovation process of management accounting. The research data clearly indicates that, where a management accountant is professionally equipped and inspired to improve his company's accounting system, more modern management accounting techniques are introduced, accepted and applied in the system, than where the accountant is less professionally competent and/or willing to improve his management accounting system; other conditions remaining the same.

The Management accountant's attitude toward introducing management accounting innovations may depend on several factors, among them are the following:

1. The accountant's perception of what type of information management needs, what type of information should he provide management and what is the best system which efficiently performs the job.
2. The accountant's expectation of how well management personnel understands financial information and to what extent they rely on it in their decision-making process.
3. The accountant's perception of the top management attitude toward change, especially in the accounting system, and his reaction to their resistance to such change.
4. The accountant's satisfaction with the company's accounting system in operation at the present time and his motivation toward modernizing such systems.

5. The accountant's technical competency acquired through formal education, special training, experience or combined and through his active membership in the professional accounting institutions or associations.
6. The accountant's age seems to constitute another important factor.

1. The accountant's perception of the function of management accounting:

The accountant's perception of the role of management accounting information system is described by one accountant, whose company is applying 5 out of 8 techniques, in the following quote:

"....accounting system, production system....etc.,....have to serve the business goals not otherwise....I believe in the KISS approach (stands for Keep It Simple Stupid)....this does not mean by any way to keep our system outdated or inadequate.... in contrast, we mean by this that we must adopt the accounting system to our needs....we keep our system flexible and open to any modern techniques we feel it is useful for our decision-making process....On the other hand, we do apply any technique just because it is new...."

Another comment relevant to this point was given by another accountant:

"....when I came to this company, I did not like the pricing formula the company was following. Then I initiated the application of this technique (Contribution Margin) to use it as basis for pricing decisions....management tried it....the technique worked....we have been using it since then...."

2. The Accountant's expectation about management appreciation of accounting information:

A typical comment about the accountant's expectation of managers; comprehension and understanding of accounting information and his reaction thereof has been given by another accountant:

"....I joined this small, family owned and managed company after I had left a larger company with a rather sophisticated management accounting system which was designed and established by an outside management consultant employed by one of the major public accounting firms....I had a very difficult time to sell that system to middle management....they could not understand it....the sophisticated system did not work....Coming out with

such experience in mind, I decided to keep this company's accounting system as simple as possible to fit the current management team's ability to comprehend accounting reports and statements and to adapt to their attitudes toward change...."

3. Accountant's reaction to management resistance to change:

An accountant whose company is using only one out of the eight techniques studied, and who has indicated that he is encountering severe resistance from his top management against any change in the company's accounting system, expressed his views as follows:

"....the application of any of these techniques would depend to a large extent, on whether top management will use the information provided by the technique or not....In our case, I do not think that our managers will understand it, they will not use it....then, there is no need to bother introducing it to them any more to reject applying it again...."

4. Accountant's satisfaction with present system:

The relationship between the extent of modern management accounting techniques and the accountant's satisfaction with his present accounting system is shown in Table V-10. Accountant's satisfaction is measured by the number of times the accountant has indicated that a technique(s) is not applied because he is satisfied with the current accounting system without the technique.

Analysis of the results indicates that those accountants who are doing less than average performance with regard to the application of modern management accounting techniques (using less than 3 techniques) are the most satisfied with their out-dated systems, and those accountants who are doing better than average are the least satisfied with the old techniques remaining in their systems. The average number of times an accountant indicated his satisfaction of his accounting system without application of the technique is 1.33 for those who are applying

TABLE V-10

COMPARISON BETWEEN THE NUMBER OF TIMES THE ACCOUNTANTS IS SATISFIED WITHOUT APPLYING MANAGEMENT ACCOUNTING TECHNIQUES AND THE EXTENT OF MODERN MANAGEMENT ACCOUNTING IN HIS COMPANY

Company Code No.	C-V-P	Contribution Margin	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budgeting	Linear Programming	Network Analysis	Number of Techniques Not Applied Because of Accountant's Satisfaction	Extent of MGT Accounting Techniques
1									0	
2									2	+
3	x	x	x	x	x		x	x	5	+
4									0	+
5									0	+
6		x				x			0	+
7				x	x				2	+
8									0	+
9									0	-
10	x	x				x			3	*
11	x	x		x	x				4	-
12									0	+
13					x				1	+
14									0	+
15									0	-
16		x							1	+
17	x	x			x				3	*
18									0	+
19					x				1	*
20									0	-
21									0	-
22									0	*
23									0	-
24									0	+
25		x							1	*
26									0	*
27	x		x						2	-
28					x				1	-
29						x			1	*
30				x					1	+
31	x			x	x	x			4	-
32									0	*
33									0	-
34									0	+
35									0	+
Total	6	7	2	5	8	4	2	1		
%	35%	28%	13%	36%	32%	27%	6%	3%		

Symbols: x = Accountant satisfied without the technique
 * = Company applying 3 techniques (the Sample Average)
 - = Company applying more than Average
 + = Company applying more than Average

less than 3 techniques, 1.18 for those who apply 3 techniques; the average, but only 0.42 for those who are applying more than the average number of techniques.

5. The accountant's technical competence:

A. The influence of the accountant's technical competence on the type of management accounting system and the extent of modern techniques applied in that system, was apparent throughout the personal interviews I conducted. The data gathered reflect the same conclusion. I have witnessed examples of accountants who are officially certified by the profession but who are, at the same time, lacking the basic knowledge of what a specific management accounting technique is, let alone the questions of its prospective usefulness in the decision-making process or how to sell it to top management. In such cases, the introduction of a new technique, even if top management is ready to accept it, becomes a matter of either reeducation to the present accountant or may involve the possibility of replacing the accountant himself for a better educated one. Such possibility has been indicated by some accountants who had been appointed for this very reason, management's desire for better educated accountants.

However, the research indicates that the great majority of accountants interviewed have the basic knowledge of the traditional accounting techniques subject to this study. But when it comes to the rather new quantitative techniques, the linear programming and network analysis taken as examples, the data clearly indicates that many accountants do not even know what these techniques are about. The great majority of the present practicing accountants in small and medium companies are

not technically equipped to handle these new quantitative techniques. At least 13 accountants have said frankly that the reason they did not apply linear programming is due to the lack of knowledge about, the nature, operationality and usefulness of the technique. In the same time, at least 11 accountants have cited the same reason with regard to not being able to apply the Network analysis (CPM/PERT). This in addition that most of those accountants who have recognized these techniques seem to lack the analytical ability necessary to apply them in operation.

Comparison between formal education, measured in terms of the degree(s) an accountant holds and the extent of modern management accounting techniques in his company, illustrates this importance of the accountant's technical competence in his ability to apply modern techniques, other conditions are the same. Table V-11 shows such a comparison.

It is significant to note the following two observations about this comparison.

- a. None of those who are doing better than average job with the application of management accounting techniques, has less than B.A. or B.S. degree in accounting.
- b. The percentage of those who hold a B.A. and M.B.A. is the highest in the better than average category than in the other two categories. This may explain the trend of hiring new M.B.A. graduates for high accounting positions to increase the effectiveness of the accounting function.

B. It became evident through the research that the more active an accountant is in his local professional associations, the more informed the accountant becomes about the new development, in the accounting field

TABLE V-11

**THE DEGREE OF FORMAL EDUCATION AND THE EXTENT OF
MODERN MANAGEMENT ACCOUNTING TECHNIQUES**

Formal Education Degree(s)	Extent of Management Accounting Techniques					
	Less than Average (less than 3)		Average (3 techniques)		Better than Average (more than 3)	
	No.	%	No.	%	No.	%
Less than B.A. (or BS)	5	33%	3	37%	-	-
B.A. (or BS)	9	60	2	25	5	42%
B.A. and M.B.A (or equivalent)	1	7	3	38	7	58
	—	—	—	—	—	—
Total	15	100%	8	100%	12	100%

and the more he is exposed to such modern techniques and becomes aware of its nature, operationality and prospective usefulness if applied in his own accounting system. The contribution of informal education and training through attending professional seminars, workshops and conventions of the local chapters of the professional associations especially the National Association of Accountants, becomes evident in many occasions throughout the personal interviews. In some cases, management accountants interviewed indicated that they started application of some of these techniques immediately after and as a result of attending one of these meetings.

However, specific data on how active an accountant is in his professional associations' activities were not possible to get in this study. At the same time, analysis of data collected on the accountants' professional membership does not give any determinate relationship between the

TABLE V-12

**THE ACCOUNTANTS' PROFESSIONAL MEMBERSHIP AND THE EXTENT OF
MANAGEMENT ACCOUNTING TECHNIQUES IN PRACTICE**

Professional Membership \ Extent of Manage- ment Accounting Techniques	Less Than Average (less than 3)		Average (3 techniques)		Better Than Average (more than 3)	
	No.	%	No.	%	No.	%
None	1	6%	-	-	-	-
CPA only	6	40	3	37%	7	58%
NAA only	4	27	3	28	1	8
CPA and NAA	4	27	2	25	4	35
	—	—	—	—	—	—
Total	15	100%	8	100%	12	100%

accountant's membership in a particular association and the extent of management accounting used in his company. Table V-12 shows this observation.

C. Analysis of the service period each accountant has spent with his present company reveals that those who are doing less than the average with regard to the application of modern management accounting techniques, are those who have spent, in general, the longest period of service. Those who are doing better than average have the shortest period of service in their companies. This may indicate that the willingness and ability for changing the accounting system prevail in the early period of service. After, some time, the longer an accountant stays in his company the less ambitious to effect change he becomes. It is significant to note that none of those accountants who are doing better than the average has spent

TABLE V-13

**THE ACCOUNTANT'S SERVICE PERIOD AND THE EXTENT OF
MANAGEMENT ACCOUNTING TECHNIQUES**

Extent of Management Accounting Techniques Service Period			
	Less Than Average	Average	Better Than Average
Less than 2 years	1	None	1
2-5 years	6	3	5
5-10 years	4	2	6
More than 10 years	4	3	None
	—	—	—
Total	15	8	12

more than 10 years in the present company he is working. Table V-13 summarizes this conclusion.

6. The Accountant's Age:

The analysis of the data gathered for this study indicates that younger accountants are more willing and able to effect change in their accounting systems and apply more modern techniques than older accountants. A comparison between the accountants' age ranges and the number of management accounting techniques applied is shown in Table V-14.

The average age of those accountants who are applying more than 3 management accounting techniques (better than the sample average), is 35.4 years old. None of them, in fact, is older than 40 years old. While the average age of those doing worse than the average, is about 48 years old. The average age of those applying 3 techniques is about 47 years old.

TABLE V-14

**THE ACCOUNTANT'S AGE AND THE EXTENT OF
MANAGEMENT ACCOUNTING TECHNIQUES IN PRACTICE**

Extent of Manage- ment Accounting Techniques Accountants' Age Ranges	Less Than Average		Average		Better Than Average	
	No.	%	No.	%	No.	%
Less than 35 years	1	7%	2	25%	5	41%
35-40	4	26	1	13	7	59
40-50	6	40	2	27	None	-
More than 50	4	27	3	37	None	-
	—	—	—	—	—	—
Total	15	100%	8	100%	12	100%
Average Age (in years)	48.1		46.5		35.4	

Then in summary, the management accountant who has been able to effect change in his company's accounting system, is more probably than not, perceptive to what type of information his management executives need and able to adapt the accounting techniques to fulfill it; understands his management's attitude toward change and able to persuade them to such change; not satisfied when the accounting system is outdated and obsolete; more educated and holds either a B.A or B.S. degree in accounting and most probably has either earned an M.B.A. degree or is working toward one, is active in his professional association, and he is young, about 35 years old.

5.7 The Extent of Modern Management Accounting Techniques and the Availability of the Necessary Human and Physical Resources Required

The availability of human and physical resources required to plan for and apply new management accounting techniques has been expressed several times by accountants interviewed, as one of the environmental conditions which influence the extent of modern management accounting techniques in the practice of small and medium manufacturing companies. Shortage of qualified accounting staff who are equipped with knowledge of these techniques and able to adapt them to particular needs of management decision-making process, is one of these requirements. Time needed for the planning stage of adopting and applying new techniques by present accounting staff was another factor. Lack of available written material or publications describing the technique, how it operates, its usefulness, and how it could be adapted to particular situation was also included in this category. The necessity of having a computer was cited by 3 accountants as a reason for not being able to apply linear programming.

Table V-15 shows the numbers and percentage of accountants who have indicated that lack of these requirements constitutes a major obstacle for the application of new accounting techniques.

Shortage of qualified management accounting staff appears to hinder most the application of responsibility accounting, contribution margin reporting and capital budgeting. The impact on the new quantitative techniques, linear programming and network analysis, cannot be determined from the data available since several of the accountants interviewed did not even know what these techniques are about. This will also hold with the next two observations.

TABLE V-15

**THE LACK OF HUMAN AND PHYSICAL RESOURCES AND THE APPLICATION
OF MODERN MANAGEMENT ACCOUNTING TECHNIQUES**

Management Accounting Techniques Human and Physical Requirements	C-V-P	Contribution Margin	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budgeting	Linear Programming	Network Analysis
Shortage of Qualified Accounting Staff	4	6	-	5	9	2	1	2
Percentage	24%	24%	-	38%	36%	14%	3%	7%
Time Press	7	11	3	7	7	2	5	2
Percentage	41%	44%	20%	54%	28%	14%	15%	7%
Lack of Written Guiding Publications	-	-	-	-	-	2	9	2
Percentage	-	-	-	-	-	14%	26%	7%
Lack of Computer	-	-	-	-	-	-	3	-
Percentage	-	-	-	-	-	-	9%	-

Many accountants have indicated a ladder of preference as to the allocation of their work time. They put on the top of this ladder the day-to-day routine work and list any needed changes afterward in order of priority. A high percentage of those who are not using the techniques are placing operating budget, contribution margin reporting and cost-volume-profit analysis in lower priorities of their preference ladder. Thus, they indicate that they do not have enough time to prepare for applying these techniques in addition to coping with regular work responsibilities.

However, two accountants have expressed that it is really a matter of conviction that these techniques are useful. Once an accountant is convinced that application of a new technique would improve his performance he would spare time for planning to apply it.

None of the accountants has mentioned that there is any lack of written material on the application of any of the traditional accounting techniques except for capital budgeting. However, many accountants have raised this point with regard to the quantitative techniques, even with recognizing that many others do not even hear about them to give any judgement about the adequacy of available written and published applications.

5.8 The Cost and Value of Information and Its Effect on Changing Management Accounting System:

Changing the management accounting system or introducing new techniques into an existing system is undoubtedly costly; it takes qualified people and time to effect such change or to plan for applying the technique. Hiring new accounting staff will add costs that the company was living without incurring before the change. This cost is attributed to the additional relevant information the management team is getting as a result of this change or the introduction of the new technique. Then the decision of whether to go ahead and change the system or remain with the status quo may depend on whether the cost of making such change is justified. This decision is based on management judgement and accountants' salesmanship in addition to the other environmental conditions discussed earlier rather than on a quantification of what price is being paid by deviating from a "best" course of action as against the cost of getting better information.

During the personal interview I conducted, the question of the cost and value of information was raised by some accountants as one of the reasons for not being able to apply one or more of the modern management accounting techniques under study. Some accountants have indicated that "the value of information derived from a new system does not warrant the cost of installing it." The potential savings from applying a new technique is not apparent. Bases for such judgement were not clear. Some other accountants indicated that the application of a technique "is too costly for them and they do not need the detailed information it will provide that bad".

Table V-16 shows the number of accountants who indicated that the cost of applying a technique is one of the reasons of not applying it till now.

TABLE V-16

COST AND VALUE OF INFORMATION AND THE EXTENT OF
MANAGEMENT ACCOUNTING TECHNIQUES

	C-V-P	Contribution Margin	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budgeting	Linear Programming	Network Analysis
Too costly to install and operate	1	3	4	2	2	-	2	-
Potential savings are not apparent	-	3	3	2	2	1	1	-

The results of the table indicate that the cost factor is not a primary factor in the change process of the accounting system but rather a minor one.

5.9 Other Environmental Factors:

The study has revealed other secondary factors which have their role in the companies' environments and directly or indirectly influence the acceptance and application of modern management accounting techniques in practice. Among these secondary conditions are the following:

1. Company's ownership change whether through offering stock to the general public or through mergers and acquisitions.
2. Banks and other financial institutions pressure especially in the case of operating and capital budgeting.
3. Business competition factors also play a role in changing the accounting system.

5.10 Conclusions:

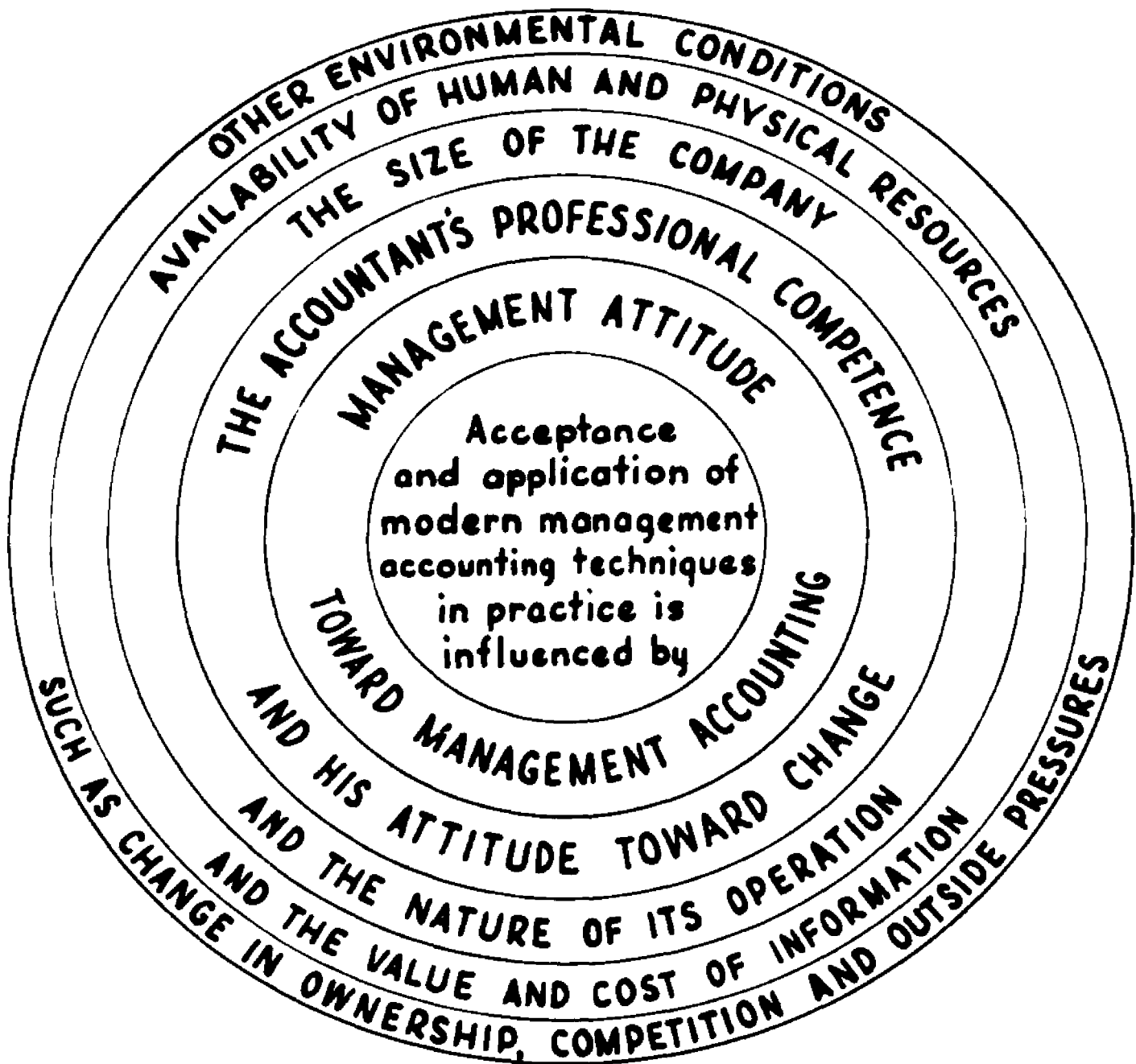
Throughout this Chapter the environmental conditions which tend to influence the acceptance and application of modern management accounting techniques in the small and medium manufacturing companies accounting systems were analyzed and significant observations were pointed out. Accounting is a business decision making tool in the business that affects and is affected by the business environment. However, the effect of the environmental conditions on innovations in accounting and on the application of these innovations in practice vary from one condition to another. From the empirical evidence this study tried to obtain, it becomes clear that top management and its attitude toward the value of accounting information and the desirability of applying modern techniques has the greatest impact on management accounting innovation. The accountant's

attitude toward change and his professional ability to effect such change represents the second important condition in the environment that influence accounting innovation. Size of the business and the nature of business operation have also affected management accounting, but they come after management and accountants influences. Availability of human and physical resources and the relative value and cost of information, are also important but to a lesser degree of importance. The type of ownership, the degree of competition are among other environmental factors which play a role in influencing the type and number of modern management accounting techniques in practice.

Figure V-1 depicts the relative degree of influence of the environmental condition upon the acceptance and application of modern management accounting techniques in practice.

FIGURE V-1

The Environmental Conditions which Influence the Acceptance and Application of Management Accounting Techniques in Small and Medium Manufacturing Firms



CHAPTER VI

DIFFUSION OF MANAGEMENT ACCOUNTING INNOVATIONS IN SMALL AND MEDIUM MANUFACTURING FIRMS

6.1 Introduction:

A survey of modern management accounting techniques accepted and applied in the practice of small and medium manufacturing firms, has been the subject of Chapter IV of this thesis. In Chapter V, the environmental conditions which tend to influence the diffusion of these techniques in practice were analyzed in detail, with particular emphasis on those conditions which tended to hinder such diffusion. In this chapter, the diffusion process of management accounting innovations will be investigated. The objective of this chapter is to answer questions such as when did change take place, what was the occasion for change and who initiated and effected such change.

The first part of this chapter is devoted to the definition of the diffusion and the adoption processes. Then the answers to these questions will follow according to the empirical findings of the research survey.

6.2 The Need for Innovation in Management Accounting:

A writer in a recent publication has spelled out the need for innovation in accounting, in the following:

"Innovation will have a higher premium than ever. Innovation can not be limited to manufacturing and engineering; it must cover marketing, accounting, personnel practices and, in fact, all functions necessary to the enterprise. The function needing innovation the most, simply because historically it has in my opinion produced the least, will be accounting....

the most important tool that management can have to cope with the problem of tomorrow is sound dynamic accounting information....¹

We have argued in Chapter III, that, in order for the management accountant to meet the challenge he faces as a result of new and continuing changes in the information needs and the evolving of mathematical and statistical techniques applicable in decision making, he must be able to adapt to this new environment and must adopt, of these modern techniques, the most appropriate ones to provide relevant economic information. His updating would produce more effectiveness and efficiency in management decision making. Only by adapting himself to the changing world around him and by being the most dynamic man in the information team, the management accountant can attain and maintain his position as the "information director" of his company.

6.3 Diffusion of Accounting Techniques in Practice:

Professor G. Jones has defined innovation as "the introduction of a new idea which will cause things to happen differently than they did before."² Similarly, Professor Rogers has defined the same term as follows:

"An innovation is an idea perceived as new by the individual. It really matters little, as far as human behavior is concerned, whether or not an idea is "objectively" new as measured by the amount of time elapsed since its first use or discovery.

¹Hugh D. Luke, "Dynamic Accounting For Effective Management," Management Accounting (May 1970), p. 11.

²Gardner M. Jones, "Accounting Innovation and the Psychology of Change," The Accounting Review (April 1962), p. 244.

It is the newness of the idea to the individual that determines his reaction to it."³

Professor Rogers has also defined diffusion as:

"the process by which an innovation is communicated from one individual to another in a social system over time."⁴

Then the diffusion process, according to Rogers, has four crucial elements, (1) the innovation, (2) its communication from one individual to another, (3) in a social system and (4) over time. This same definition could be applied to the management accounting area. The modern management accounting techniques represent the innovations. The spread of the new accounting technique from the management accountant, a member of top management and/or an outside consultant to its ultimate users or adopters will represent the communication of the accounting innovation. The business organization in which diffusion of accounting innovation is taking place represents the social system. And of course diffusion works over time in any social environment.

Before any diffusion process could take place there should be someone within or outside the business organization who has adopted an innovation and who is willing and able to act as a "change agent" in this business organization. In the next two sections the adoption process and the agents of change will be discussed.

6.4 The Adoption Process:

The adoption process has been defined by Professor Rogers as:

³ Everett M. Rogers, Diffusion of Innovations, The Free Press (New York 1962), p. 13.

⁴ Ibid., p. 19.

"the mental process through which an individual passes from first hearing about an innovation to final adoption."

He says that the adoption process may be arbitrarily broken into five stages: (1) awareness; (2) interest; (3) evaluation; (4) trial and, (5) adoption. The adoption process is differentiated from the diffusion process in the sense that the adoption process deals with adoption of a new idea by one individual while the diffusion process deals with the spread of new idea in a social system.

A brief summary of Professor Rogers' definitions of these five stages is as follows:

1. At the awareness stage, the individual is exposed to the innovation but lacks complete information about it.
2. At the interest stage the individual becomes interested in the new idea and seeks additional information about it.
3. At the evaluation stage the individual mentally applies the innovation to his present and anticipated future situation, and then decides whether or not to try it.
4. At the trial stage the individual uses the innovation on a small scale in order to determine its utility in his own situation to judge its usefulness for possible complete adoption.
5. At the adoption stage the individual decides to continue the full use of the innovation.⁵

However, Professor Rogers, later in his book recognizes the fact that this break down is arbitrary and specific knowledge about each stage may prove to be difficult to get. In addition, it is not necessary that these five stages will be met separately before complete adoption of an innovation in actual life. In many cases, some of these stages

⁵Ibid., p. 76-120.

may be combined together or skipped over to the final adoption.

The Adoption Process in Management Accounting Innovation

Complete and direct data on the specific stages of the adoption process, regarding management accounting innovation, as defined above, is not available from the empirical data I have gathered through the personal interviews. However, somewhat incomplete information on the adoption process could be obtained indirectly by deduction from the available data. The results, though incomplete, should give a credible approximation to the real adoption process of modern management accounting techniques in the practice of those companies under study.

We will deal with the adoption process of management accounting innovations by the management accountant only, because data regarding the adoption of these innovations by top management and/or outside consultants is not available. In addition, we will add another stage to Rogers' five stages. This stage will represent the situation preawareness, and we may call it unawareness stage, where management accountants have acknowledged that they have not been exposed to specific innovations before the interview.

Complete and specific information on those techniques which are already adopted by the management accountants and diffused in practice is given in Chapter IV. In Chapter V, we have mentioned those techniques about which management accountants have indicated lack of exposure and lack of knowledge. In addition, we have direct data, gathered through the interviews on innovations in which accountants have shown interest and which they said they are in the process of evaluating. The missing data, then, is about those innovations which are in the awareness stage. However, an approximate idea is derived by the deduction process of the

TABLE VI-1

**THE ADOPTION PROCESS OF MANAGEMENT
ACCOUNTING INNOVATION IN PRACTICE**

The Adoption Stages	C-V-P	Contribution Margin Reporting	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budgeting	Linear Programming	Network Analysis
Unawareness Stage	2	1	-	1	3	2	13	11
Awareness Stage (Approximate)	12	16	11	11	14	11	18	18
Interest and Evaluation Stages	3	8	5	2	8	2	3	-
Adoption Stage	<u>18</u>	<u>10</u>	<u>19</u>	<u>22</u>	<u>10</u>	<u>20</u>	<u>1</u>	<u>6</u>
Total number of respondents	35	35	35	35	35	35	35	35

available data from total observations. Table VI-1 shows the management accounting innovations and the approximate stages of the adoption process they are in.

The following are the most significant observations that result from information included in the above table.

1. The very low number of new quantitative techniques adopted and diffused is matched with a relatively high number that are in the unawareness stage. Accountants have frankly said they did not know these techniques.
2. The highest number of techniques that are in the interest and evaluation stages are in the contribution margin reporting, responsibility accounting; each of them was found to be related to one of the other highly adopted techniques. Contribution margin reporting is related

to cost-volume-profit analysis and responsibility accounting is well fitted to operating budgets.

3. The numbers and percentages of those techniques which are in the awareness stage, with regard to each accountant, are greater than those which are considered in the unawareness stage. Almost all accountants interviewed are at least aware of management accounting innovations under study. This observation of course applies more properly to the traditional accounting techniques rather than to the new quantitative techniques.

There is another significant observation which results from the empirical data and which is related to this point, though not included directly in the table. Among all the companies participating in this study, only two companies had tried the application of a new technique and then decided to give it up for one reason or another. One of these companies tried to use linear programming technique and then rejected continuing its application on the ground that the technique requires "too many guesses and assumptions"; once actual events deviate greatly from these assumptions, the expected results turn out to be inaccurate and inadequate to evaluate the actual performance. The second company has tried both linear programming and CPM and later it stopped using both of them. It discontinued applying linear programming because, "it was difficult to explain and sell to top management" and difficult to be understood by the operating management. It dropped the Critical Path Method because it "requires too many guesses and assumptions" to work with.

However, none of the companies studied, have indicated the rejection of any of the other techniques, once they were put into application, by the "change agent" who led the diffusion process of the technique within the business.

6.5 The Agents of Change in Management Accounting:

A "change agent" has been defined as a professional person who attempts to influence an adoption decision in a positive direction.⁶ Essentially the change agent is the link between the world of business where managerial, technical and financial problems exist, and the world of professional expertise where the solution to the problem may be found. To transfer knowledge and understanding of how to use that knowledge scientifically, an agent must be able to play any or all of a variety of roles; as an analyst, advisor, and/or innovator. The challenge to the change agent is to selectively mix the necessary knowledge, skill and attitude to accomplish the desired result of transferring knowledge and understanding to his client.⁷

At least three distinctive types of change agents were found to be working in the change process of management accounting in practice. The management accountant, one or more of the top management team and/or the outside consultants are under discussion in this section. They work individually or with each other in influencing the type and number of management accounting techniques to be adopted and diffused in practice. The detailed results of the empirical research are illustrated in Table VI-2.

6.5 The Management Accountant as "Agent of Change":

In Chapter V, it was pointed out that the management accountant is a major partner in the change process of management accounting practice

⁶ Roger, Diffusion of Innovations, p.

⁷ Harold K. Charlesworth, "The Uncertain Future of Small Business: Can This Picture be Changed," M.S.U. Business Topics, Spring 1970.

TABLE VI-2

AGENTS OF CHANGING THE MANAGEMENT ACCOUNTING SYSTEMS

Question: Who could be considered the source of initiating the idea of applying this technique in your company?	C-V-P	Contribution Margin Reporting	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budgeting	Linear Programming	Network Analysis
Management Accountant alone	12	4	10	10	6	7	-	1
Percentage	67%	40%	52%	45%	60%	35%	-	17%
Top Management alone	2	3	6	7	2	4	1	3
Percentage	11%	30%	31%	32%	20%	20%	100%	50%
Management Accountant and Top Management	3	1	-	1	1	5	-	2
Percentage	16%	10%	-	5%	10%	2%	-	33%
Management Accountant and Outside Consultant	-	-	-	-	-	2	-	-
Percentage						10%		
Top Management and Outside Consultant	1	2	3	4	1	3	-	-
Percentage	6%	20%	16%	18%	10%	15%	-	-
	<u>18</u>	<u>10</u>	<u>19</u>	<u>22</u>	<u>10</u>	<u>20</u>	<u>1</u>	<u>6</u>
Total	100%	100%	100%	100%	100%	100%	100%	100%

His attitude toward change is one of the major environmental conditions found to influence the diffusion of accounting practice. In this section, however, we will only concentrate on the accountant's role as a change agent; the person who has worked toward introducing and diffusing

modern management accounting techniques in practice. This discussion will be in addition to what has been covered in the previous chapter.

According to the findings shown in Table VI-2, the accountant's role as a change agent has been clearly felt in introducing the traditional accounting techniques into the management accounting practice of small and medium companies under study. But his role in diffusing the rather new quantitative techniques is less apparent and at a very low scale. In fact, linear programming has been introduced in the only company found using the technique, by the top management, specifically by the president who is an engineer, not by the accountant. With regard to network analysis (PERT/CPM), the accountant has introduced the technique in only one of the six companies using it, though he had participated with top management in applying the technique in two other companies.

However, the management accountant's role in diffusing the traditional techniques is well apparent as illustrated in Table VI-2 above. According to the findings of this study, he has practically assumed the major role in diffusing 67 percent of the cost-volume-profit analysis applied in practice; 60 percent of the responsibility accounting; 52 percent of the standard costing; 45 percent of the operating budget, 40 percent of the contribution margin reporting and 35 percent of the capital budgeting. In addition, in other companies he has participated with top management and/or outside consultant in introducing these techniques. The cumulative percentages of the number of companies where the management accountant has participated in introducing these techniques either by himself as the primary change agent or cooperating and helping either his top management initiation or an outside consultant, would be;

89 percent for C-V-P, 80 percent for contribution reporting, 70 percent for responsibility accounting, 56 percent for operating budget, 52 percent for standard costing and 45 percent for capital budgeting.

The accountant's role in the actual application and day-to-day working with these techniques also seems to be a basic role. Again, it appears that his role is limited to the traditional accounting techniques. The actual application of linear programming is found to be in the domain of an operating department, the engineering department, and none of the network analysis techniques were found to be applied exclusively by the accountant. In 50 percent of the cases, the accountant has been working with operating management in applying PERT/CPM techniques. The actual work in the other 50 percent is done by operating management without the accountant's help.

However, the management accountant has the dominant role in the actual application and administration of the other "traditional techniques." The details of his role regarding this point is shown in Table VI-3 below.

The results included in the table above, shows the the responsibility of actual application of the traditional accounting techniques lies in the accounting department in the great majority of the cases. In all companies which use contribution margin reporting, the application of the technique is the accounting department's responsibility. The same is the case with all but one of the companies using cost-volume-profit analysis and responsibility accounting. Eighty-four percent of standard costing application is the responsibility of the management accounting department. The role of the accounting department is still major, though not dominant in applying operating budgets. However, the

TABLE VI-3

**THE MANAGEMENT ACCOUNTANT'S ROLE IN THE ACTUAL APPLICATION
OF MANAGEMENT ACCOUNTING TECHNIQUES**

Question: Who Does the figuring for actual application of the technique:	C-V-P	Contribution Margin Reporting	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budgeting	Linear Programming	Network Analysis
The Management Accounting Dept.	17	10	16	15	9	9	-	-
Percentage	94%	100%	84%	68%	90%	45%	-	-
An Operating Department	-	-	2	-	-	3	1	3
Percentage	-	-	11%	-	-	14%	100%	50%
Both Management accounting and Operating Departments	1	-	1	7	1	8	-	3
Percentage	6%	-	5%	32%	10%	40%	-	50%
	<u>18</u>	<u>10</u>	<u>19</u>	<u>22</u>	<u>10</u>	<u>20</u>	<u>1</u>	<u>6</u>
Total	100%	100%	100%	100%	100%	100%	100%	100%

department influence lessens with regard to the actual figuring and application of capital budgeting technique, where it is responsible for only 45 percent of the cases. Nonetheless, the accountant shares the responsibility of applying a high percentage of the other techniques with the heads of operating departments. This case is particularly apparent in capital budgeting, operating budgets, and network analysis.

6.5 Top Management as "Change Agents":

It is important to reemphasize at this point that the interviews undertaken for this study were limited to the heads of the management accounting function in the companies. No attempt was made to interview any one of the top executives beyond the accountant. Though a great majority of these accountants are considered members of the top management team, they are considered here for the sake of analysis as separate. The top management term here denotes all other top executives except the chief accountant whatever his title is. Accordingly, information obtained about the role of top management in the change process of management accounting is the result of the accountants' opinions and feelings, the the possibility of their material bias is not entirely excluded.

The effect of top management attitude toward or against adopting and diffusing management accounting innovations was pointed out and discussed in detail in Chapter V. It was found out that the major, though not the only, environmental condition which influence the diffusion of innovation in management accounting, is the top management attitude toward modernizing the accounting function in their companies. And it was concluded that the main, though not the only hurdle, which stands against diffusing accounting innovation is due to top management unwillingness to encourage the change process in the accounting area.

In this section, we will deal with the role of top management as change agents in those companies where modern accounting techniques have been introduced and applied. Of course, because top management has the final word on approving the application of any new technique, its acceptance of such application is a necessary prerequisite for any

diffusion process to take place. In fact, some of the techniques adopted by the accountant, were subject to rejection during the diffusion process unless one or more of the executives had supported this diffusion process. The support of top management for accounting innovation is necessary if a successful diffusion process is likely to occur, not only at the top executive hierarchical level but at all the lower operating levels as well. As an example, the president of a medium sized company, a liberal engineer, stood behind his young well educated management accountant during the diffusion process of management accounting innovations, and enabled him to modernize the accounting function from a bookkeeping function to a well rounded management accounting function. Seven of the eight techniques are applied in this company. Six of them were introduced by the accountant and supported by the president in spite of objections from some of the other top executives as well as resistance of operating managers to change. The seventh technique is adopted by the president himself.

In contrast to the accountant, top management seems to have the major role as agents of change in diffusing the quantitative techniques rather than the traditional accounting technique, as indicated in Table VI-2. Linear programming, as we mentioned earlier, was introduced in the sole company found applying the technique, by the chief executive of that company. In 5 out of 6 cases of PERT/CPM usage, the technique was adopted and diffused by either top management alone or with cooperation of the management accountant.

Top management has also been acting as "agent of change" in introducing traditional accounting techniques, though at lower proportions. Capital budgeting was introduced by top management alone or with

the help of management accountant and/or outside consultant in 55 percent of the times; 20 percent of the times have been introduced by top management without the help of either. Thirty-two percent of operating budgets applied in practice were initiated by top management alone, in addition to another 23 percent introduced with the help of outside consultant and management accountant. Thirty-one percent of standard costing techniques were initiated by top management. It sought the help of outside consultants in another 16 percent. Top management could also have the credit of diffusing the practice of 30 percent of the contribution margin reporting and 20 percent of the responsibility accounting with partial credit for another 20 and 30 percent of the cases. Top management role as a change agent was least apparent in diffusing cost-volume-profit analysis; where it was considered the primary change agent in only 11 percent of the cases and the secondary agent in another 22 percent of the application of the technique.

6.5 The Outside Management Accounting Consultant as a "Change Agent"

Both the accountant's and the top management's roles in the diffusion process of management accounting innovations have been discussed in detail in Chapter V and supplementally in the previous two sections of this chapter. But until now the role of an important possible source of change has not been mentioned. Therefore, this section will deal, in detail, with the outside consultant and his role as an effective change agent in diffusing management accounting innovations.

1. The Extent of Using the Outside Consultant Services in Management Accounting

The empirical research indicates that small and medium manufacturing companies subject to this study did not seek the maximum prospective

help available to them through the outside management services consultants in the area of management accounting. The data gathered shows that only 5 companies, 14 percent of sample, used to call outside consultants on frequent basis. In one of these companies, the outside consultant role seems to supplement the function of the accounting department in the company on a permanent basis. He provides the company with "chart-graphic" service on monthly basis for the financial activities done the month before, which includes financial data and profitability measurements on charts. Each month, top management meets especially to discuss the outside consultant's analysis and interpretations given along with the charts.

Another 15 companies, 43 percent of the sample, did call on outside consultants for service in management accounting but their calls were on an infrequent basis, ranging between one call only in company's life time, to a few calls in recent years. However, the last 15 companies, also about 43 percent of sample, did not call at all on any outside consultant for management accounting service.

Two significant observations related to the subject are due at this point. The first is that all the companies which have never called on outside consultant services, are classified in the small size category. They represent 60 percent of the small companies included in the sample. None of them was a medium sized company. The second observation, is that the average number of management accounting techniques adopted and diffused in these companies is about 2.53 techniques per company, and average which lies below the performance of the sample average of 3.03 techniques. The difference in this performance may indicate, to some

extent the importance of the outside consultant role in the diffusion process of management accounting innovations. This high proportion of the sample which never experienced outside consultant services in management accounting may show how little opportunity has been given to the consultant to share in the change process, particularly in the small manufacturing firms.

The role of outside consultant, however, has been felt through the personal interviews with management accountants. He has been an active change agent in some of the companies studied. In fact, according to the information included in Table VI-2, above, the credit of diffusing about 12 percent of management accounting techniques found to be applied in practice, are due to the outside consultant's services either by top management invitation or by the accountant's invitation pending of course, on the approval of top management. The contribution margin reporting, standard costing, operating budget and capital budgeting are the four management accounting techniques most influenced by the outside consultant, as shown in Table VI-2. However, none of the quantitative techniques found applied in practice, have been reported to be the result of an outside consultant's recommendations to companies used his services.

2. The Need for the Outside Consultant in Management Accounting

Several reasons were given by management accountants interviewed for calling on outside consultants to provide them with services in the management accounting field. Some of the major reasons are stated in the following paragraphs.

a. Lack of required qualification by the internal staff: Of course one apparent and simple reason for calling on an outside consultant

is the conviction by management, accountant or both, that the outside consultant have something which is not available to the company without his services. In 12 companies, 60 percent of those called upon an outside management accounting consultant, sought his help because they felt that the internal staffs of the company's accounting department did not possess the required professional competency needed to suggest an effective solution to an outstanding problem or to initiate the adoption of a new technique the company found necessary to apply. This case has been more evident in situations of introducing a comprehensive budgeting program or changing the costing system from actual costing to standard costing.

b. Top management preference to get an outsider to make objective independent recommendations. This preference is also shared in some cases by the company's management accountant. Getting an outsider to appraise the present situation, point out the probable problem and its possible causes, and then recommend objective, nonbiased recommendations, was the reason behind preferring to assign such a job to an outside consultant. This preference to the consultant's independence has happened in 8 companies, 40 percent of those who had used the services of outside management accounting consultant.

c. Shortage in the internal accounting staff and the press of time on the available people. Available staff were barely sufficient for day-to-day routine work. No one is available for extra assignment. Even if they have someone who has the required qualification to prepare for the needed change, they would have to take him away from his regular daily work, and they could not afford that. Getting an outside consultant

to do this extra job would relieve the available internal staff to handle its regular work without disruption. Seven accountants, 35 percent of those who used outsiders' services, have indicated this factor as one of the important reasons for seeking outside consultant services.

d. To back up the management accountant's suggestions submitted to top management. This reason is somewhat related to the second reason discussed above. Management accountants who have pointed out this factor feel that, once their top management will get the outside consultant's independent recommendation which may more or less agree with their own suggestions, top management might be induced to change and be more willing to go along with their own accountants' suggestions. Possible agreement between accountant's suggestions and outside consultant's recommendations comes from the fact that some accountants work closely with their consultants to a point where it is possible that mutual discussion about the problem may result in more or less mutual opinion about its causes and cures. At least four accountants have felt that this factor is one of the important reasons for which they needed to call upon outside consultants.

e. Costs less than to hire a permanent accountant. Another reason given by management accountants for their companies' calls upon outside consultants is an economic reason. They believed that hiring an outside consultant, on a temporary basis, for performing a specific service might be less expensive than if they had to hire a permanent qualified management accountant for doing such job. These accountants and/or their top managements believed, in addition, that they have enough help for their regular routine accounting work; what they need is someone

to provide a specific service whenever a need for such service arise. Only three accountants specifically mentioned this reason among the reasons for calling on outside consultant in management accounting.

3. Services Rendered by Outside Consultants:

The services rendered to the companies by outside consultants ranged from just submitting a recommendation for a solution to a specific problem, to a complete check up on the soundness of the whole existing management accounting system for further action. Table VI-4 shows the general types of services provided by the outside consultants.

TABLE VI-4
THE GENERAL TYPES OF SERVICES RENDERED
BY OUTSIDE CONSULTANT

Purpose of Consultant's Visit	No. of Companies	% of Companies called on outside Consultants
a. To recommend a solution of specific problem	14*	70%*
b. To install a new system (or technique in a system)	12	60
c. To improve the existing system	7	35
d. To just check on the soundness of the existing system	<u>2</u>	<u>10</u>

*Totals do not add up because some accountants gave more than one purpose

a. The most repeated purpose for calling upon outside consultants appears to be the realization by either the management accountant, his

top management or both, of the existence of a specific problem which needs an urgent solution and for one or more of the reasons mentioned earlier the internal accounting staff are not able to provide the needed solution. An apparent alternative available is inviting outside consultant to recommend a solution to such specific problem. His service either would end with just submitting this recommendation or it may be extended to implementation of the recommendation. Fourteen companies, 70 percent of those who had services by outside consultant gave this as one of the purposes of his visits. Measuring by the frequency of mentioning this purpose, it seems that this is the major one though not the only.

b. The accountants in twelve companies, 60 percent of those who had called on outside consultants, have indicated that installing a new accounting system or introducing a new technique in an existing system is one of the purposes for which they had invited the outside consultant.

Table VI-2 above, shows that the outside consultant's recommendations were adopted in installing at least 6 percent of the cost-volume-profit analysis applied in practice; 20 percent of the contribution margin reporting, 16 percent of the standard costing, 18 percent of the operating budget, 10 percent of the responsibility accounting and 25 percent of capital budgeting.

c. The third purpose for outside consultant's visits has been cited by accountants interviewed as to recommend improvements to the existing accounting systems in their companies. Such involvement might have come incidentally and indirectly through the association of the company with its public accountant who is assigned the auditing of the company's financial records. He may have pointed out the existence of some

weak points in the current system which may need improvements. The company management accountant an/or the top management might ask the public accounting firm to send in its specialist to review the case and submit his recommendations. Seven companies, 35 percent have indicated that improving the existing system is one of the major purposes of using outside consultant's services.

d. Inviting an outside consultant to just check on the adequacy and soundness of the current existing system was mentioned by two accountants as one purpose for outside consultants invitation to their companies. However, for these two specific companies, it appears that a check up was just the beginning of the outside consultant's mission. Because data available indicates that they have called on the consultant's services for other purposes as well.

4. The Effect of the Outside Consultant's Recommendation in the Change Process of Management Accounting

One way to measure this effect is to see to what extent top management have adopted the outside consultant's recommendations which is supposed to be the product of his services. Generally, the results of the study indicate that most of the companies which have used outside consulting services in management accounting, have in most cases adopted the outside consultant's recommendations. This general conclusion may indicate that the outside consultant has proved to be an effective change agent in those companies which had allowed him to participate in the change process. However, this conclusion does not conflict at all with the earlier conclusion, that the outside consultant effectiveness as a change agent is limited because of the fact that 43 percent of the companies included in this sample have never had a chance to experieiment with his

services. They had never called on an outside consultant in the management accounting area.

In more specific terms, in answering a question on how often top management have decided to adopt the outside consultant's recommendations, the following is the summary of the replies to the question:

a. Seven companies, 35 percent of those used the services, said that their management had adopted the outside consultant's recommendations more than 75 percent of the time.

b. Eight companies, 40 percent, indicated that their management had adopted his recommendations in between 50 and 75 percent of the times.

c. However, management accountants in 5 companies, 25 percent of those used the consultant's services, had indicated that their management has been less receptive to outside consultant's recommendations. They only adopted such recommendation in less than 50 percent of the times.

5. Factors Which Are Against the Outside Consultant's to Become a More Effective "Change Agent"

In a previous part of this section, we have indicated that 43 percent of the sample called on outside consultants on an infrequent basis; whenever the accountant and/or top management feel that there is a need for the consultant's services. We have also found that only 14 percent had needed the consultant's services in such a way that necessitated their frequent invitation to him over time. However, on the other hand, the study results show that there are another 43 percent of the sample, 15 companies, that have never called on an outside consultant, to provide them with his services in the management accounting area, for one reason or another.

When the management accountants of those firms were asked why did they never call on outside management accounting consultant, they gave several reasons. The most important reasons are discussed in the following.

- a. Not economically feasible. Eleven accountants, 73 percent of those whose companies never invited an outside management accounting consultant, believe that the cost of the consultant's services are too expensive and their companies are either not prepared to pay such cost, or it can not afford it. They consider the consultant's fees are too high for their company to afford. It may be important to reemphasize here, that all of these companies are categorized as small sized companies; none of them is medium sized.
- b. No serious problem faced. The second reason given for not seeking the help of outside consultant's services in this area, has been the belief of either the accountants, top management or both, that they had not met any problem which is serious enough to need outside help. The feeling of a need for consulting services was not powerful enough to justify the cost of hiring a consultant. Seven accountants, 47 percent, have shared this point. One of them expressed it as: "...it is not that we know everything, but we did not meet a problem which requires their services."
- c. Have a capable staff. Another reason, though it seems related to the above one, has been given by another group of accountants. They pointed out their high

confidence and reliance on their internal staff, on the basis that they are qualified enough to cope with any problem their companies had met so far. For this group, it is not a matter of not meeting any serious problem that needed major changes in their accounting systems, rather than, they have been successfully able to effect the required change whenever needed. Seven accountants have expressed this factor as one of the major reasons for not hiring an outside consultant. Some of them said they had worked as professional consultants before and they now feel that they acquire the professional capability in addition to their inside understanding of their existing systems.

- d. Most of his time spent to understand our system. Although the accountants with whom we are concerned here, are those employed by firms which did not use outside management accounting consultants services, some of these accountants had experienced dealing with an outside consultant before in a previous company. Some of them had worked in consulting firms themselves before joining their current companies. And some of them have listened to the experience of their peers and reacted accordingly. Five accountants, about 33 percent, have raised the point that most of the outside consultant's time usually is spent to understand the present local system and its mechanism. He needs "too much time to be familiar with the system before he is able to give any useful recommendations." Though it is most likely

that the consulting service may come from the same public accounting firm which audits the company's financial records, and great deal of data about the current system may be available, in most cases a specialist consultant may work on consulting basis when the company wishes to seek a specialized service.

- e. Often recommends too complicated a system for the existing staff to work with to justify his high fees. This serious allegation about the outside consultant has been raised by 3 different management accountants interviewed. They claim that after spending too much time on the assignment, the outside consultant comes with his recommendation for a new or modified system which tends to be more difficult for the available staff, to understand, raising the possibility of incurring more expenses either for reeducating the present staff or for hiring more qualified people. They also maintain that in some cases, the company might not need such a sophisticated system to solve the problem for which it had invited the outside consultant.
- f. A temporary involvement tends to be a permanent engagement. A rather more serious allegation against the outside consultants, is that consultants, though they are hired initially on a temporary basis to recommend a solution for specific problem or to install a specific system or technique in the system, in some cases convert the engagement into an unintended permanent affair. Management decision not to

get involved with outside consultant has been due, in these accountants' views, to the fear of getting into such a situation. Only two accountants, fortunately, shared this view.

- g. Management resistance to outside intrusion. The resistance of giving voluntary access to the company's financial records to any outsider including the outside consultant was cited during the interviews as another reason why a company did not use consultant's services. This view is held especially in a few of family owned, nonpublic companies. They still regard financial information as their own private business secrets.
- h. Difficulty and ambiguity of the contract about the outside consultant's responsibility after providing his services are also mentioned as reasons producing fear of engaging with outside consultants, and lessening the possibility of giving him the chance to play his role as an effective "change agent" in the management accounting area.

One accountant summarized most of the above points in expressing his personal feeling toward seeking outside consultants services in the following quotation:

"....they are expensive....they over-step their bounds, instead of doing a practical job they intend to do a job which keeps them permanently with the company they are servicing....they last longer...they cost more than originally estimated....they over sold what really they can do...."

Though these are the personal opinions of those accountants quoted, and though not all accountants interviewed shared these opinions, nonetheless they express the attitudes of their holders. One significant

implication is the fact that in order for the outside consultant to participate in the change process of management accounting in these accountants' firms, he must be able first to change these negative attitudes toward the usefulness of his services. This has to be done before he could have the opportunity to be invited into these companies and be able to contribute to the diffusion process of accounting innovations.

6.6 The Occasions of Management Accounting Innovations:

To explain the occasions of innovations is to explain why a specific old accounting system that has been regarded as satisfying certain people (the accountant, top management or both) according to certain criteria, no longer does so. Occasions of innovations as they are taken here represents the incidents which might be responsible for the process of change to have its start. Table VI-5 exhibits the different occasions that led to the initiation and application of modern management accounting techniques in practice.

In general, awareness of a definite problem and awareness of the existence of an accounting technique which might provide more relevant information for making better decisions to solve that problem, leads to revision of the standards of satisfaction with the present accounting and induce favorable conditions to adopt more modern techniques. This is quite apparent from the information included in the above table. A high proportion of the modern management accounting techniques found applied in practice are adopted and applied because of the need for a more effective tool to provide relevant information for making more informed decisions to solve a specific problem. No attempt is being made to get detailed data on what specific problems these companies had faced to

TABLE VI-5

THE OCCASIONS OF MANAGEMENT ACCOUNTING INNOVATIONS

[illegible]

induce the change. However, competition problems are included in this category though it is note the only type of problems indicated incidentally by accountants. Solving a specific problem constitutes a very important occasion for accounting innovations. This is especially clear in the cases of standard costing, capital budgeting and PERT/CPM.

Change in the accounting philosophy of the accounting department of the company is another occasion for innovation. This change may happen as a result of change in the present accountant's attitude toward how management accounting in his company should be, what purpose should it serve and which techniques should be employed in the system. The change could also come as a result of changing the management accountant himself i.e., employment of a new Controller.

Of course another important occasion for management accounting innovations comes about as a result of change in the attitudes of management toward the usefulness of management accounting in their decision making process. We have seen that resistance to accounting changes on the part of top management constitutes the major though not the only environmental factor which hinder such changes. Any change in management attitudes from the opposition side to the support side will significantly open the door for change to take place. Some of the change in management attitudes is a result of replacing the old top management by a new team or a new president. Change of the ownership status of the company has also an effect on top management attitudes. Of course the success of the change process would be enhanced if a change in the attitudes of either accountant or management were accompanied by a change in the attitude of the other in the same direction; supporting the winds of change.

A fourth stimulus for change has been indicated as the adoption of what the company considers as industry wide accepted technique. This is particularly significant in standard costing, where about one fourth of companies applying this technique mentioned this reason as their inducement to adopt it in their companies.

Table VI-6 shows, in details, the purposes in which every technique was first applied and the purposes in which the technique was secondly applied.

Pricing and budgeting are the most two purposes for which cost-volume-profit relationships was first applied. While sales mix and acceptance of special orders are most important as second applications of the technique. Profitability comparison and product pricing are the first and second applications of responsibility accounting in most companies applying the technique. Product pricing and inventory valuation was the first application for standard costing. Cost control, and pricing and bidding, were its second applications. Controlling operations and planning for future operations were the first and second applications for operating budget. Fixing responsibilities was the first application for responsibility accounting. Measuring performance of different responsibility centers was its second purpose. For capital budgeting, planning for expansion and planning for replacements constituted the first and second applications. Production scheduling and product mix are the only two applications for the sole linear programming application found in this sample. To meet specific finishing or delivery dates is the first application of PERT/CPM.

TABLE VI-6

**THE PURPOSES OR OBJECTIVES OF APPLYING
MANAGEMENT ACCOUNTING TECHNIQUES**

Question: In which purpose this technique was applied, first; and second:	First Application	Second Application
I. <u>C-V-P</u>		
Pricing	10	11*
Budgeting	4	5
Addition or Deletion of Product Line	2	4
Sales Mix	1	6
Acceptance of special order	1	6
Channels of distribution	-	2
Total	<u>18</u>	<u>2</u>
II. <u>Contribution Margin Reporting</u>		
Profitability Comparison	6	3
Product pricing	2	3
Operation control	2	1
Executive compensation	-	1
Total	<u>10</u>	
III. <u>Standard Costing</u>		
Product Costing and inventory valuation	16	1
Cost control	2	13
Pricing and bidding	1	13
Measuring performance	1	12
Budgeting	-	11
Total	<u>20</u>	
IV. <u>Operating Budget</u>		
Controlling Operation	12	4
Planning future operations	4	7
Both planning and control	6	1
Communication	-	6
Motivation	-	3
Total	<u>22</u>	

Technique and its application purposes	First Application	Second Application
V. <u>Responsibility Accounting</u>		
Control of Operation - Fixing responsibility	5	4
Measuring Performance	3	6
Managers Compensation. Motivation	2	4
Total	<u>10</u>	
VI. <u>Capital Budgeting</u>		
Planning for expansion only	13	2
Planning for Replacement only	2	7
Planning for Both Expansion and Replacement	3	-
Controlling Capital expenditure	1	4
Total	<u>19</u>	
VII. <u>Linear Programming</u>		
Production Scheduling and inventory planning	1	-
Production mix	-	1
	<u>1</u>	
VIII. <u>Network Analysis (PERT/CPM)</u>		
To meet delivery date	2	-
To move plant equipment to a new location	1	-
Product development and marketing	1	-
Installing budgeting system	1	-
Planning for computer installation	-	1
Production scheduling	1	-
Combining two plants	-	1
Total	<u>6</u>	

6.7 When Did Change in Management Accounting Take Place:

The results of the personal interviews indicate that the history of modern management accounting techniques in the accounting practice of small and medium manufacturing companies, has a rather short period of time. These companies started to use modern management accounting technique

TABLE VI-7

**RELATIVE AGES OF MANAGEMENT ACCOUNTING
TECHNIQUES IN PRACTICE**

Question: When did your company start using this technique?		C-V-P	Contribution Margin Reporting	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budgeting	Linear Programming	Network Analysis
a. New this year		1	-	1	4	2	3	-	1
Percentage		6%	-	5%	18%	20%	15%	-	17%
b. 1-5 years ago		8	5	3	9	5	9	-	5
Percentage		44%	50%	16%	41%	50%	45%	-	83%
c. 5-10 years ago		7	3	4	6	3	6	1	-
Percentage		39%	30%	21%	29%	30%	30%	100%	-
d. More than 10 years ago		2	2	11	3	-	2	-	-
Percentage		11%	20%	58%	14%	-	10%	-	-
Total		<u>18</u>	<u>10</u>	<u>19</u>	<u>22</u>	<u>10</u>	<u>20</u>	<u>1</u>	<u>6</u>
Average age period		5.9	6.5	9.4	5.3	4.1	5.2	7.5	3

rather recently. Table VI-7 shows the distribution of the techniques applied according to the time period they have been in practice of those companies since their adoption.

In fact the data collected on this question indicates that about 15 years ago none of the eight techniques under study (with the possible exception of standard costing) was in application by any of the companies

interviewed. Standard costing appears to be the oldest technique in practice. Its average age period is about 9.4 years, with 58 percent of the companies using it more than 10 years ago. The linear programming techniques was initiated between 5 and 10 years ago. Contribution margin comes next in order with an average age of 6.5 years, with only two companies applying the technique more than 10 years ago. Cost-volume-profit analysis comes next with 5.9 years average age, with 50 percent of the companies applying the technique within the last 5 years. Operating budgets and capital budgets seem to have emerged in the same period with 5.3 and 5.2 years age for each. Four companies in the case of operating budget and 3 companies in the case of capital budgeting started to apply the techniques only this year. Responsibility accounting is a very young technique in the practice of these small and medium companies. Its average age is only 4.1 years with 70 percent of the adoptions within the last 5 years. The youngest technique in practice of the sample is PERT/CPM. All the companies applying this technique have adopted it within the last 5 years.

This relatively short history of modern management accounting techniques in the small and medium manufacturing companies implies a significant conclusion. That is, though diffusion of innovations in management accounting had started very late, and the extent of such innovations is still somewhat limited; nevertheless the momentum of change seems to have gained higher speed in recent years. The high proportions of techniques started in application within the last 5 years is an important indication for such a conclusion.

6.8 What Do Innovations of Management Accounting Contribute:

Objective measurement of the contributions of modern management accounting techniques is beyond the scope of this study. Yet, the accountants interviewed were asked to express their judgment on the contribution of each of the techniques studied and the results of these judgements are included in Table VI-8.

As we emphasized earlier, segregation of the effect of each of these techniques on the effectiveness and efficiency of business decision, is difficult to attain especially with companies most of which are closely held and where data on financial records is not accessible to outsiders beyond government agencies. However, in the opinion of accountants interviewed management accounting techniques have proved useful in many areas. Although profitability is a product of complex of factors, it has been cited as one of the most important areas to which the application of these techniques contribute. This was especially apparent in the cases of C-V-P analysis, contribution margin and responsibility accounting. A relatively high percentage of C-V-P analysis and capital budget provided more relevant information to planning. Standard costing, operating budget and responsibility accounting were praised because they provided relevant information for control. However, both the planning and control functions of management were aided by the application of linear programming, responsibility accounting, operating budget, C-V-P, capital budget and network analysis in most cases. Better pricing was attributed to standard costing, C-V-P and to lesser extent, to contribution margin reporting. However, one significant observation is obvious from the data available with regard to the contribution of

TABLE VI-8

CONTRIBUTIONS OF MANAGEMENT ACCOUNTING INNOVATIONS

Question: In your Opinion, does this technique contribute to:		C-V-P	Contribution Margin Reporting	Standard Costing	Operating Budget	Responsibility Accounting	Capital Budgeting	Linear Programming	Network Analysis
1. Profitability		12*	7	8	10	7	7	-	2
%		66%	70	42	45	70	35	-	33
2. More Relevant Information to Planning Only		4	1	-	1	1	9	-	1
%		22%	10	-	5	10	45	-	17
3. More Relevant Information for Control Only		1	2	5	5	2	-	-	-
%		6%	20	26	22	20	-	-	-
4. More Relevant Information for both Planning & Control		10	4	8	13	6	10	1	3
%		55%	40	42	59	60	50	100	50
5. Better Pricing		9	4	10	5	1	-	-	1
%		50%	40	53	22	10	-	-	17
6. Communication		5	1	1	8	5	2	-	-
%		28%	10	5	36	50	10	-	-
7. Motivation		5	2	1	5	6	-	-	-
%		28%	20	5	22	60	-	-	-
8. Unable to Judge		-	-	-	1	-	-	-	-
%		-	-	-	5%	-	-	-	-

*Do not add up because accountants were asked to give more than one answer

modern techniques to both communication of information and motivation of people. A rather low percentage of accountants cited that new techniques have any contribution either to communication or to motivation. However, responsibility accounting, operating budget and cost-volume-profit-analysis were mentioned to have been contributing to better communication and better motivation. Only one accountant was unable to judge the usefulness of standard costing technique in his company.

6.9 Summary:

In this Chapter, the diffusion process of management accounting innovations has been analyzed in detail. The adoption process with its five steps was applied to the empirical findings of the study. The roles of each of the top management, the management accountant and the outside management consultant were analyzed to illustrate their effectiveness in the change process. The role of the outside consultant was discussed in more detail because of its potential importance in the diffusion process and because we did not deal with it in the previous chapters. Limitations of the outside consultants as change agents were also discussed in the Chapter. The occasion of innovations, the time when adoption of innovations took place, and the contribution of these innovations to the effectiveness and efficiency of the management process, were pointed out.

CHAPTER VII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

7.1 Summary

The spreading of competition, the increasing size of business enterprise, the growth of industries requiring heavy investment, the growing complexities of production operation, and the separation between ownership and management, all are factors which tend to force a transition from management based on individual's memory of past historical experience and intuition, to management heavily dependent on objective judgment based on relevant information. Therefore, management information requirements have risen sharply and will continue to rise as the pace of this dynamic change accelerates. In order for businesses to remain competitive and to progress, or even in a relatively large number of cases, to survive, more relevant information is needed for management decision making process.

Management accounting objective is to provide historical and projected economic information to persons within the organization that enable them to make informed judgments and effective decisions to achieve the organization's goals. In serving management's requirement for such information, the management accountant must apply the appropriate concepts and techniques in processing and communicating economic data.

The first part of the objective of this study has been to find

out the extent of application of management accounting techniques in current practice of small and medium companies. Investigating the environmental conditions which influence the diffusion process of these techniques in practice, constitutes the second part of the objective of this study.

The scope of this study has been limited to eight selected techniques. Six of them could be called "traditional accounting" techniques and the other two "non-traditional" new quantitative techniques which have been advocated by many writers to be very useful in providing management accounting information for decision making. The eight techniques are: 1) Cost-volume-profit analysis; 2) contribution margin reporting; 3) standard costing, 4) operating budget; 5) responsibility accounting; 6) capital budgeting; 7) linear programming; and 8) network analysis (PERT/CPM).

Personal interviews have been conducted with the chief management accountants in 41 manufacturing companies; thirty-five of these companies represent the usable sample for this study. All these companies are located in the State of Michigan. The guiding questionnaire used as a basis for collecting the research data during these interviews, is included in Appendix B.

Classification of these companies according to their size into small and medium companies is based upon five size criteria; annual employment, annual sales, total assets, number of major products or product lines and number of manufacturing departments. The weighted average size of these companies resulted in a sample composed of 25 small and 10 medium companies. Large and largest companies are excluded from the scope of this study.

A description of the characteristics both of the companies included in the study and of their management accountants is made in Chapter II.

Management has been defined in Chapter III as a social process with planning, organizing and control as its three basic functions. The management accountant, as a member of the management executive team, has the responsibility of providing relevant information to help other executives plan, organize and control operations under their areas of responsibility. However, his role is more dominant in the planning and control functions of management, and management accounting techniques are more related to these two functions. The second part of Chapter III, has been devoted to brief description of each of the eight selected management accounting techniques.

In Chapter IV, survey of the current practice of these management accounting techniques was made to find out the extent of their application in small and medium manufacturing companies. Two aspects have been studied for this purpose. The first was to find out the extent of application of each technique in the sample at large. The second was to determine the number of these techniques applied by each company.

Accounting is a business decision making tool that affects and is affected by the business environment. Therefore, the environmental conditions which tend to influence the diffusion process of management accounting innovations in current practice has been the subject of analysis in Chapter V. Other aspects of the process of diffusing management accounting innovation were studied in Chapter VI with special emphasis on the agents of change in management accounting

area. Their respective roles, contributions to change and their limitations were discussed. The role of outside management accounting consultants was analyzed at length in this chapter, beside the management accountant and top management.

7.2 Findings of the Study:

Analysis of the results of the empirical research reveals the following findings:

1. Modern management accounting techniques are not highly popular among the small and medium manufacturing companies subject to this study. The most applied technique in current practice, as evidenced from this research, is the operating budget; 63 percent of the companies included in the sample are using the technique. The least popular technique in current practice is linear programming, where it was found that only one company of the 35 included in the sample, is applying the technique.
2. There is a difference in the extent of application of these techniques between the "traditional accounting" techniques and the "non-traditional" techniques. The difference also exists between "old traditional accounting" and "new traditional accounting" techniques. The "traditional accounting" techniques are found to be more popular in management accounting practice than the "non-traditional" quantitative techniques, like the network analysis (PERT/CPM) and linear programming. Quantitative techniques are still very unpopular in small and medium companies. Even in the "traditional accounting" techniques, we found that relatively old

techniques like operating budget, C-V-P, standard costing and capital budgeting are more popular than the relatively new responsibility accounting and contribution reporting techniques.

3. The average manufacturing company in the sample is found applying only 3 of the eight techniques selected for this study. None of the companies, whose accountants are interviewed, is using all the eight techniques, and only one company is found using 7 techniques.
4. There is a relationship between the size of a manufacturing company and the number of management accounting techniques adopted and applied by the company. But, this relationship is not statistically significant. Size is one of the environmental factors which tend to influence the diffusion process of management accounting innovations. But it is not the only determinant of how much and how modern should management accounting be in a company. There are other environmental conditions which influence this diffusion process.
5. Top management and its attitude toward the value of management accounting information and its desirability to apply modern techniques in management accounting have the primary impact on the process of diffusing management accounting innovations. Its resistance against change of management accounting represents the greatest obstacle for such change.
6. The management accountant's attitudes toward change and his professional competency to effect change in his company's management accounting information subsystem, represent the

second most important environmental condition that influences the diffusion process of management accounting innovations.

7. The nature of business operation, the availability of human and physical resources required, the relative value and cost of information, the type of ownership and the degree of competition are found to be important factors in the company's environment that tend to influence accounting innovations, though their importance seem to come after top management attitudes, accountant's competency and attitudes, and the size of the business.
8. The very low number of new quantitative techniques adopted and diffused in current practice of small and medium companies, is due especially, to management accountants' unawareness and their lack of knowledge of these quantitative tools of decision-making. Even though, the management accountant is found to be the major "change agent" in diffusing "traditional" accounting techniques. In contrast to the accountant, top management seems to have the major role in diffusing the quantitative techniques.
9. The empirical research indicates that small and medium manufacturing companies did not seek the maximum prospective help available to them through the outside management accounting consultants' services. Reasons given for the unwelcoming attitude toward outside consultants include:
 - a) not economically feasible; b) no serious problem faced;
 - c) company has capable staff; d) most of outside consultant's

time is spent to understand local system; e) often recommends too complicated system for the existing staff to work with, to justify his high fees; f) a company's temporary involvement with outside consultant tends to be permanent engagement; and g) management resistance to any outside intrusion to their "business secrets".

7.3 Conclusions

The following are the principal conclusions resulting from the findings of this study:

1. Knowledge of modern accounting techniques, their definitions, prospective usefulness and their operationality, alone by itself, does not necessarily guarantee the adoption and application of these techniques in the real world of practice. Accountant's ability and desire to understand and appreciate the environmental conditions which surround his company and his capability to initiate and effect change seem to be more important factors than the mere mastering of technical aspects of these techniques. Making management accounting students aware of the importance of these environmental factors, should be an essential part in any management accounting course the objective of which is to teach these techniques.
2. Salesmanship, persuasiveness and communication accessibility seem to be essential characteristics that management accountant should acquire beside the technical knowledge of accounting techniques, to be effective in performing

his role in the change process. Knowledge of a technique however needed, will not ensure the application of such technique in a company, until the accountant will be able to sell the technique to his management and the management becomes convinced that application of the technique is in the best interest of their company's goals and is congruent with theirs too. Then motivation for changes might start.

3. A need for continuing education for current management accountants, especially to equip themselves with deeper knowledge of the new quantitative decision making techniques is also evidenced by the results of this research. If the management accountant is serious in his willingness to meet the challenge he faces in the new era of information technology, he must seek to improve his competency not only by updating himself on the new developments in accounting in its traditional sense but also, to seek and acquire adequate knowledge of the new quantitative tools of decision making. Otherwise, accountant will lose his position in the executive team as the man most identified with information, to a more aggressive and competent professional.
4. One recommendation to the professional accounting associations which this study reveals, is due at this point. The educational efforts both of the American Institute of Certified Public Accountants and the National Association of Accountants, in the field of management accounting have been tremendous, especially on the national level. However, much greater need exists for local educational activity,

particularly by the CPA's and NAA's chapters of which management accountants are members. Workshop activities which deal with actual management accounting problems have been done successfully on the national level. These activities should be more fruitful if they are done on the local chapters' level too. Local chapters workshop activities which deeply involve the members of the chapters will provide opportunities for exposure and experience for these members through dealing with their own professional problems. A prominent problem of one accountant today might have been a problem of a fellow accountant in the past. Though situation might differ, peer's experience might help. New techniques might be recommended. The adoption process might start with its first step; awareness of the existence of a technique that might help solving a problem.

7.4 Recommendations for further Research:

The following are some of the avenues open for further research on the diffusion process of management accounting innovations in practice:

1. Some studies are made on the behavioral effects of the actual applications of some management accounting techniques, especially budgeting, on people. But very little is known about the behavioral effects of people's attitudes on the diffusion process of management accounting innovations. This current study has opened the door for such an approach. However, a deeper and more comprehensive study

on the behavioral attitudes of people during the steps of the adoption process of accounting innovations, is recommended.

2. Another behavioral study could concentrate on the management accountants themselves, from the sociological, psychological aspects. Such study would answer some questions like why do they choose to be management accountants, how different they are from other professional groups and whether they did plan to be what they are or becoming an accountant is accidental and is subject to the incidents of time and place.

THE GUIDING QUESTIONNAIRE FOR PERSONAL INTERVIEWS

a. Company Name

b. Major Products

c. Size: 1. Sales 2. Employment
3. Total Assets Invested 4. Market Share
5. Number of Products 6. Number of Departments

d. Name of the management accountant interviewed

1. Position in the organization (Title)

2. Education
Less than B.A. or B.S.
B.A. or B.S.
MBA (or equivalent)
Others

3. Membership CPA Yes [] No []
NAA Yes [] No []

4. How long you have been working in this company

5. How old are you?

- a. To provide information for planning only.
- b. To provide information for control only.
- c. To provide information for both planning and control.
- d. Preparation of financial reports.
- e. Other (specify).

a. Do you classify your costs into variable costs and fixed costs?
Yes [] No []

b. Do you use the Cost-Volume-Profit analysis? Yes [] No []

c. In what form?
[] 1. Formal (Explicit)
[] 2. Informal (Implicit)

- d. By which method?
- ☐ 1. Graphical
 - ☐ 2. Mathematical
 - ☐ 3. Both
- e. What are the major applications (or objectives) of the C-V-P technique in your company?
- ☐ 1. Pricing and bidding (including costing alternatives)
 - ☐ 2. Sales mix
 - ☐ 3. Channels of distribution
 - ☐ 4. Addition or deletion of product line
 - ☐ 5. Acceptance of special orders
 - ☐ 6. Budgeting
 - ☐ 7. Others (specify)

B-2 Contribution Margin Reporting

- a. Does your company analyze contribution margins?
- ☐ Yes ☐ No
- b. If "yes" above by what segments?
- ☐ 1. Divisions or Departments
 - ☐ 2. Products
 - ☐ 3. Territories
 - ☐ 4. Jobs
 - ☐ 5. Other segments (specify)
- c. What are the major applications of the contribution margin technique?
- ☐ 1. Current control
 - ☐ 2. Product pricing
 - ☐ 3. Profitability comparisons
 - ☐ 4. Executives compensations

B-3 Standard Costing

- a. Do you use standard costing? ☐ Yes ☐ No
- If yes,
- ☐ 1. For material cost ☐ Yes ☐ No
 - ☐ 2. For labor cost ☐ Yes ☐ No
 - ☐ 3. For overhead cost ☐ Yes ☐ No
- b. On what basis?
- ☐ 1. Technical engineering study
 - ☐ 2. Average of past historical cost
 - ☐ 3. Estimated future cost
 - ☐ 4. Other basis (specify)
- c. Do you use variance analysis to control operations and pinpoint responsibilities? ☐ Yes ☐ No
- | | | |
|----------|------------------------------|-----------------------------|
| Material | ☐ Yes | ☐ No |
| Labor | ☐ Yes | ☐ No |
| Overhead | ☐ Yes | ☐ No |

- d. Are variance accounts included in your formal books
☐ Yes ☐ No
 or you keep them outside the books?
☐ Yes ☐ No
- e. In your company, what are the major objectives of the standard costing technique?
☐ 1. To control cost
☐ 2. To measure performance
☐ 3. To provide data for product costing and inventory valuation
☐ 4. To provide data for pricing and bidding
☐ 5. To provide data for planning purposes (help in building budgets)
☐ 6. Other (specify)
- f. What is your costing method?
☐ 1. Job Order Costing
☐ 2. Process Costing
☐ 3. Both

B-4 Operating Budgets

- a. Do you use budgetary planning and control ☐ Yes ☐ No
- b. What is the extent of budgeting you use?
☐ 1. Partial budgeting (specify)
☐ 2. Comprehensive budgeting
☐ 3. Operating budgeting
☐ 4. Capital budgeting
☐ 5. Both operating and capital budgeting
- c. Who participates in setting the comprehensive budget?
 1. President and Top Management
 2. Operating Management
 3. Management Accountant
 4. Others
- d. At what levels?
☐ 1. Divisions or departments
☐ 2. Foremen
☐ 3. Salesmen
☐ 4. Others (specify)
- e. What are the major objective(s) of the flexible budget?
☐ 1. Better control
☐ 2. Better planning
☐ 3. Both control and planning
☐ 4. Motivation
- f. Do you prepare a flexible operating budget for a range of activity instead of a single level? ☐ Yes ☐ No

B-5 Responsibility Accounting

- a. Do you have an organization chart?
☐ 1. Yes
☐ 2. No
☐ 3. Formal
☐ 4. Informal

- b. 1. Are your performance reports prepared in such a way to report only those controllable costs and expenses at each level of responsibility?
☐ Yes
☐ No
2. Or they are prepared in such a way as to differentiate between controllable costs and uncontrollable costs but total costs are reported to each level of responsibility.
☐ Yes
☐ No
3. Or are your reports prepared in total form without differentiating between controllable and uncontrollable cost classifications?
☐ Yes
☐ No
- c. What are the major applications (or objectives) of responsibility accounting in your company?
☐ 1. Motivation - Compensation
☐ 2. Control - Fixing responsibility
☐ 3. Measurement of performance
☐ 4. Others

B-6 Capital Budgeting

- a. Do you use capital budgeting in planning for capital expenditure?
☐ Yes
☐ No
- b. What criteria do you use to determine the investment decision? (Check all that apply.)
☐ 1. Urgency and need
☐ 2. Availability of cash appropriation
☐ 3. Pay-back period
☐ 4. Accounting average rate of return on investment
☐ 5. Discounted rate of return on investment (ROI)
☐ 6. Present value
☐ 7. Other (specify)
- c. What are the major applications and objectives of your capital budgeting program?
 1. Replacements only
 2. Expansion and growth
 3. Both replacements and expansion
 4. Others

B-7 Linear Programming

- a. Do you use linear programming technique in decision making?
☐ Yes
☐ No

- b. By which method?
 - ☐ 1. The graphical method
 - ☐ 2. The simplex method
 - ☐ 3. The transportation method
- c. What are the major applications of linear programming in your company?
 - ☐ 1. Product mix
 - ☐ 2. Blending or mixing problems
 - ☐ 3. Production scheduling and inventory planning
 - ☐ 4. Machine loading
 - ☐ 5. Shipping and physical distribution problems
 - ☐ 6. Other (specify)

B-8 PERT (or CPM)

- a. Do you use Program Evaluation and Review Technique or Critical Path Method in your planning and control decisions?
 - ☐ Yes ☐ No
- b. To what extent?
 - ☐ 1. PERT (CPM)/Time
 - ☐ 2. PRTT (CPM)/Cost
 - ☐ 3. Both
- c. What are the major applications of PERT (CPM) in your company?
 - 1.
 - 2.
 - 3.

Series C

- C-1 In what situation the technique was first applied?
 - a.
 - b.
- C-2 When did your company start using it?
 - ☐ a. Application has just started this year
 - ☐ b. Between 2-5 years ago
 - ☐ c. Between 5-10 years ago
 - ☐ d. More than 10 years ago
- C-3 In what other decision areas are you applying this technique?
 - a.
 - b.
 - c.
 - d.
- C-4 What was the occasion to initiate the application of this technique in the first place.
 - ☐ a. To aid solving specific problem
 - ☐ b. Change in accounting philosophy (New Controller)
 - ☐ c. Change in management attitude
 - ☐ d. Competition factors
 - ☐ e. Industry wide accepted technique
 - ☐ f. Other (specify)

- C-5 a. What could be considered the source of initiating the idea of applying this technique in your company?
- ☐ 1. The controller department
 - ☐ 2. Top management
 - ☐ 3. Newcomer
 - ☐ 4. Outside consultant
 - ☐ 5. Not known
 - ☐ 6. Other (specify)
- b. Who does the figuring for actual application of the technique?
- ☐ 1. The controller department
 - ☐ 2. The operating department
- C-6 a. How well satisfied are you with the results of applying this technique?
- ☐ 1. Extremely satisfied
 - ☐ 2. Moderately satisfied
 - ☐ 3. Not satisfied
- b. In your opinion, does this technique contribute to:
- ☐ 1. Profitability
 - ☐ 2. More relevant information for planning only
 - ☐ 3. More relevant information for control only
 - ☐ 4. More relevant information for both planning and control
 - ☐ 5. Better pricing system
 - ☐ 6. Better communication
 - ☐ 7. Better motivation
 - ☐ 8. Others (specify)
- C-7 In case you do not use this technique now, under what circumstances do you think you might apply it?
- a.
 - b.
 - c.
 - d.
- C-8 In case you have tried to use this technique and then gave it up, what were the main causes for giving up?
- ☐ a. Too costly to install and operate
 - ☐ b. Too time consuming to work with
 - ☐ c. Requires too many guesses
 - ☐ d. Too complicated for present accounting staff
 - ☐ e. Difficult to explain and sell to top management
 - ☐ f. Difficult to be understood by operating managers
 - ☐ g. Lead to conclusions which did not correspond with internal (subjective) feelings
 - ☐ h. Not workable for our size, business etc.
 - ☐ i. Not applicable to our operation
 - ☐ j. Other (specify)

C-9 In case the technique was investigated and the decision was made not to use it, what are the main reasons for unacceptability?

- ☐ a. Too costly to install and operate
- ☐ b. Too complicated to understand
- ☐ c. Potential savings from application are not apparent
- ☐ d. Requires computer which is not available now in our company
- ☐ e. Lack of available written material of application as guidance
- ☐ f. Time does not allow to design the operation of the technique and provide for needed information
- ☐ g. Resistance to change on the part of management from what is known practice to what has not been tried by the company.
- ☐ h. Others (specify)

C-10 In case you did not consider this technique before would you state the main reasons for not considering it?

- ☐ a. Not applicable to your business operation
- ☐ b. Time press--too busy to think of applying any new technique
- ☐ c. Shortage of accounting staff
- ☐ d. Satisfied with the performance of the present system
- ☐ e. Attitude of management toward changing the system
- ☐ f. Lack of available written material of application to be used as guidance
- ☐ g. Not feasible for our company size
- ☐ h. Others (specify)

Series D

D-1 a. Do you usually call on outside consultants?

- ☐ 1. Yes
- ☐ 2. No

b. For what purpose?

1. To check on the existing system
2. To install new system
3. To improve the existing system
4. To recommend a solution to a specific problem when it arises

D-2 Why did you call on outside consultants?

- ☐ a. Prefer outsider to come in to make the objective recommendations
- ☐ b. Reluctance on the part of people in charge to say what is needed to be changed
- ☐ c. Shortage in the controller staff
- ☐ d. Lack of required qualification by the internal staff
- ☐ e. More economical to call on outside consultant than to hire permanent management accountant
- ☐ f. Other (specify)

D-3 How often has the top management decided to adopt the outside consultant's recommendations?

- ☐ a. Less than 50% of the time
- ☐ b. Between 50% and 75% of the time
- ☐ c. More than 75% of the time

Series E - Miscellaneous

E-1 Which of the management techniques considered by this study which you are not using now, you feel that your company would be better off if they are applied? (Specify)

APPENDIX B

Dear Mr.

Mr. Saber Awad, a doctoral candidate in this department, is doing his dissertation research under my direction. The subject of his inquiry is the extent of acceptance and application of "modern" managerial accounting techniques in smaller and medium-sized manufacturing firms. I wish to solicit your assistance for Mr. Awad in completing his research.

Management accounting concepts and techniques have long been recognized as useful tools for planning, decision-making, and control. The management accountant is usually considered an active member of the management team. The usefulness of some of the newer techniques--critical path method, linear programming, statistical regression, economic order quantity, and other models, as well as some less new ones, such as marginal analysis, and flexible budgeting, -- are advocated by many writers in the management accounting literature. However, the need exists for empirical evidence as to actual extent of acceptance in practice, and for an identification of the surrounding conditions where acceptance and use of these techniques are practicable.

Mr. Awad is attempting to gather such empirical evidence, both out of personal interest and to meet dissertation requirements for the doctoral degree. This evidence should be useful to accounting educators and to the National Association of Accountants, as a measure of the success of their extensive continuing education efforts.

He has constructed an "Interview guide" for obtaining the necessary data. Your help and cooperation will make accomplishment of his study possible. He would like an appointment with you in the near future to explore the set of questions with you. The discussion should take 2 hours at the most. Mr. Awad will not ask questions that could be construed as prying into the affairs of your firm. Furthermore, complete anonymity will be maintained in discussing the results of his study. He will call you to find out if you are willing to help, and to set up an appointment.

Thank you for your cooperation.

Sincerely,

Gardner M. Jones
Professor

APPENDIX C

SIZE CLASSIFICATION AND THE OVER-ALL AVERAGE SIZE OF EACH COMPANY IN THE SAMPLE

Companies Code Number	Size Criteria					Average Size (complexity)
	Employment	Sales	Assets	Products	Department	
1	S	S	S	S	M	Small
2	S	S	S	S	S	Small
3	S	S	S	S	S	Small
4	S	S	S	S	S	Small
5	S	M	M	S	S	Small
6	M	M	M	V.S.	S	Medium
7	S	S	S	M	S	Small
8	L	M	M	M	L	Medium
9	S	S	S	S	M	Small
10	S	S	S	M	M	Small
11	S	M	M	L	L	Medium
12	S	M	M	S	L	Medium
13	S	S	M	S	S	Small
14	M	M	M	L	M	Medium
15	M	M	L	M	M	Medium
16	M	L	M	L	M	Medium
17	S	M	M	L	L	Medium
18	L	M	M	M	L	Medium
19	S	S	S	S	M	Small
20	S	S	S	S	V.S.	Small
21	S	S	S	M	S	Small
22	S	S	S	V.S.	M	Small
23	S	S	M	M	S	Small
24	S	M	S	S	S	Small
25	V.S.	S	S	S	S	Small
26	L	M	M	M	M	Medium
27	S	S	S	M	M	Small
28	S	S	S	M	S	Small
29	S	S	S	S	L	Small
30	S	S	S	V.S.	L	Small
31	S	S	S	S	V.S.	Small
32	S	S	S	S	M	Small
33	S	S	S	S	V.S.	Small
34	S	S	M	S	M	Small
35	S	S	S	S	M	Small

V.S. = very small

S = small

M = medium

L = large

Weights: V.S. = 1

S = 2

M = 3

L = 4

Example: Average size of
company no. 15 =

$$\frac{3 + 3 + 4 + 3 + 3}{5} = \frac{16}{5}$$

= 3.2 (Med)

According to this classification the sample is composed of
25 small and 10 medium companies.

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